Smart Computing

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IN PLAIN ENGLISH

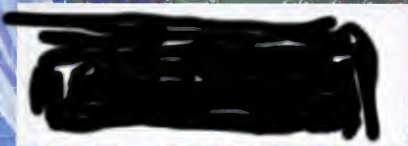September 1999 Vol. 10 Iss. 9 $3.95 U.S. $4.95 Canada

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Focus On:

High-Speed Internet Access

Corrections/Clarifications:

The August 1999 article "Focusing On Digital Cameras" included an incorrect Web address for Digital Camera Magazine. The correct address is http://www.digicamera.com.

The July 1999 Find It Online section incorrectly stated that the Maps On Us Web site covers the United States and Canada. The site actually covers only the United States.

DirectWeb, covered in the July 1999 Technology News section, changed its pricing structure shortly after that issue went to press. After 36 months DirectWeb returns the $150 security deposit to customers who return their PCs. The customer can keep the PC after 36 months in exchange for the security deposit. Also, DirectWeb added a $65 shipping and handling fee to users' costs.

Customer Service

About The Site ...

If you're looking for a comprehensive computing reference, look no further than the *Smart Computing* World Wide Web site. Our searchable site provides the complete text of issues available on newsstands, plus previews of upcoming issues. The archive includes articles from past issues of *Smart Computing* and the popular *Guide* and *Learning Series*. Check in regularly; we add new information daily.

Tip Of The Month: *Chat Preferences*— *Smart Computing* chat room users will find handy customization tools inside each chat room. Look for an option called Chat Preferences to the right of the Comment line. Click the link to reach a screen where you can customize the refresh rate, the order in which comments appear, and the font size. Make your selections and click Save to save your selections on our server so you won't need to change them each time you log on or enter a different chat room.

Upcoming Special Issues Available On Newsstands ...

PC Novice Guide Series:
Fixing Y2K Problems

How to prepare yourself and your computer system for the Year 2000.

PC Novice Learning Series:
Computing Tips & Tricks

Helpful hints for using your computer more effectively.
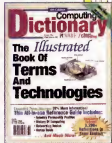
Reference Series:
Computing Dictionary (Fourth Edition)

Definitions of computing and technology terms.

small business association dues: $450 (450 miles)

payroll & accounting software: $760 (760 miles)

office supplies: $150 (150 miles)

remembering who you work for:

priceless

Online Energy Access

Ongoing federal deregulation in the energy market means you may soon be able to use the Internet to compare energy prices, choose an energy provider, and even pay your energy bills.

Already, 19 states—including California, Nevada, and Texas—have passed laws to open the market to energy-provider competition. New York, Vermont, and Michigan are planning similar legislation, and the 28 remaining states are currently considering some form of utility deregulation, according to the U.S. Energy Information Administration (http://www.eia.doe.gov).

Energy service generally involves three parts: the generation of energy; the lines for transmission of the energy; and customer service for billing, reading meters, and everything else. In the states that are deregulating utility companies, the energy generation and customer service elements are open for competition (among state-licensed providers), while the lines themselves remain the property and responsibility of government-regulated utility companies.

Deregulation means that you don't have to buy your energy from the local company anymore, although the local state-licensed providers will continue to oversee the transport of energy through the lines and into your home. This new-found versatility has prompted companies to take business online. For example, Bay State Gas (http://www.baystategas .com), which provides energy to customers in Maine and New Hampshire as well as Massachusetts, offers online account information and bill payment.

Online energy shopping and information sites are also appearing, offering customers a convenient way to purchase energy-related products and search for alternative energy providers in a specific area. Energyguide (http://www .energyguide.com), for example, bills itself as a "one-stop" site for energy information and purchase. The service, developed by Nexus (http://www .nexusenergy.com), offers utility deregulation information for every state. Customers can find energy-related offers, compare prices, and even change their energy suppliers.

Utility.com (http://www.utility .com) takes the process one step further. The company's site is operational for California and is a bona-fide energy provider registered with the state's public utilities commission. The company plans to begin offering services in Pennsylvania, Rhode Island, and Massachusetts during the summer of 1999 and will reach Nevada, Arizona, New York, and New Jersey by early 2000.

Utility.com doesn't charge a security deposit or fee for switching providers. It brings energy to customers by leasing the existing energy lines from local utility companies and buying the power whole-sale directly from those generating the energy. Deregulation laws require local utilities to ensure energy service and maintain public wiring.

Customers could see lower, or at least comparable, costs buying energy from a Web-based business. These companies save money throug lower transaction costs, fewer employees, and inexpensive information transmission. ▐

Women On The Web

WOMEN WILL BE the prominent gender on the Internet in North America, according to research firm Computer Economics. The firm predicts women will make up nearly half of Internet visitors worldwide by 2001.

Region	Male	Female
Africa	72% - Male	28% - Female
Asia Pacific	60%	40%
Europe	60%	40%
Middle East	85%	15%
North America	49%	51%
South America	70%	30%
Worldwide	55%	45%

Illustrations: Adam Cohen
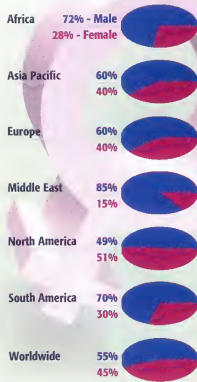
Online Textbook Sales Get Big

E-commerce pioneer Amazon.com (http://www.amazon.com) may be the undisputed giant of online book selling, but a few competitors are beginning to edge their way into the Web-based textbook sales market. These growing companies offer sites devoted to students, and along with plenty of titles, they offer student-friendly services such as free shipping and used-book buyback offers.

One such upstart, BIGWORDS.com (http://www.bigwords.com), provides prospective textbook buyers with a simple, no-nonsense interface that lets them search by author, title, or ISBN numbers (a 10-digit publishing number found on every book, located near the copyright information).

Matt Johnson founded bookseller BIGWORDS.com in 1998, and the company utilizes a 180,000 square-foot distribution center for handling student orders. During 1998's first college semester, the company handled orders from 1,500 schools across the nation. The site lets students buy or rent new or used books, offers buy-back features for selected books, and even throws in free shipping (as long as you can wait eight to ten business days).

Competition has already arrived for BIGWORDS.com in the form of Ecampus.com (http://www.ecampus.com), which launched its textbook-oriented Web site in July. The Ecampus.com site's big draw is its ability to match your class schedule to the required books and materials for participating schools. Also, students can sell back selected used books, participate in textbook auctions, and track their online shipments. The company is collaborating with NuvoMedia Inc. (http://www.nuvomedia.com), makers of the pocket-sized electronic Rocket eBook, to bring downloadable versions of textbooks to the Web site. ∎

Virtual Sensation

True three-dimensional (3-D) touch capabilities in virtual reality is the goal of a team of scientists at Suzuki Motor Corp. (http://www.suzuki.com) and MIT's Rapid Autonomous Machining Laboratory (http://www.mit.edu). In orderto reach its goal, the team is combining computer-aided design and manufacturing software with a haptic device. A haptic device is one with an interface that lets users experience the sense of touch in a computer-based application.

Until now, haptic devices worked only through a single point of touch, which meant users wearing specially wired gloves could only touch one side of an object in a digital image, instead of exploring the entire item. The researchers have expanded that point into a 3D-body and can now simulate the interaction of various 3D objects, giving users the feel of interacting with a solid item complete with textures and dimensions.

Applications for such a realistic virtual touch abound, including computer-aided design, surgical simulation, and many types of training. According to researchers, one of the first applications for the new haptic system will be the virtual creation of machine tools. Such a program will require extreme accuracy to represent the real-life interaction between a cutting tool and the object it's creating. ∎

Put Data Under The Scope

A database is important not only for the data it contains but also for the relationships that exist among that data. Large organizations and businesses know this and have become proficient at using data-mining software to identify the trends and idiosyncrasies underlying every mass of data. After a long wait, data mining has finally come to the desktop in the form of DataScope 2.0, a data-mining application produced by Mindmaker Inc.

By using data-mining software for marketing analysis and other related studies, users can reveal relevant consumer-purchasing patterns. For instance, pharmacists and physicians can use it to see a relationship between two seemingly unrelated drugs.

DataScope works with any database that complies with the Open DataBase Connectivity (ODBC) interface. Microsoft Excel, Microsoft FoxPro, dBase, and Corel Paradox are four examples of ODBC databases. After the user imports the database, DataScope analyzes it and builds charts and graphs illustrating data relationships. Users can explore these relationships at their leisure to discover information that might be of value.
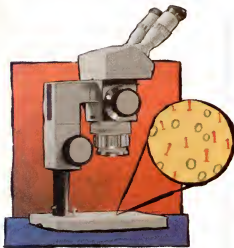
DataScope has also simplified the process of creating queries and selections. This not only makes finding specific information possible, it also simplifies the process of extracting categorical data from the database. For example, by using data-mining software, a company could easily learn the names of all its customers who live on 42nd Street and if they have purchased a certain product within the last 60 days.

We found DataScope easy to install and use. The interface can present several charts simultaneously and modify charts to show many perspectives. The charts could overwhelm some users, but users who are familiar with databases should be able to decipher the charts with ease. We recommend DataScope for independent professionals, business executives, scientists, students, and small offices that rely heavily on database information. Consider, for example, how DataScope could assist a medical doctor. Without DataScope, the doctor's database may list only the names, addresses, billing records, and medical histories of patients. With DataScope, the doctor might discover a relationship between patients who live in a certain neighborhood and the symptoms and ailments of which they complain. DataScope could help doctors treat patients more effectively.

DataScope costs $129.95 and is available for Windows 95, Windows 98, and Windows NT 4.0. Users can also download a demonstration copy from the Mindmaker Web site at http://www.mindmaker.com /Products/datascope.htm.

PowerPoint Gets A Voice

Add a virtual narrator to your Microsoft PowerPoint presentations with KartaNarrator from Karta Technologies. Using text-to-speech synthesis software, KartaNarrator will recite text that you enter into the program's text editor. The program then synchronizes the text with your presentation. The result is a speaking on-screen avatar who guides the audience through your PowerPoint presentations.

KartaNarrator provides six narrators, including a wizard, a genie, and "Bill," a befuddled salesman. The narrators make simple gestures, such as pointing at specific elements on-screen while they present. Although some might regard the narrators as unprofessional, others may view them as a comical addition to your presentation. Still, we recommend considering your audience and subject matter first before using KartaNarrator. To purchase KartaNarrator, you can either download the program or order it by phone for $99.95.

KartaNarrator's virtual narrators, such as Merlin the wizard, enhance PowerPoint displays through words and gestures.

Match the word on the left with its opposite on the right.

fermés	terminer
nord	compliqué
gauche	droite
ancien	perdre
sim[...]	ouverts
de[...]	monter
[...]	nouveau
	sud
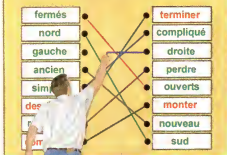
Talk To Me, Amigo

One of the biggest problems with learning a foreign language on your own is that you don't have any way of knowing if you are speaking it correctly. Auralog's TeLL me More is a software application that uses voice recognition capabilities to help you do just that.

TeLL me More includes several videos, more than 2,000 language-learning exercises, and 96 fill-in-the-blank drills. But its most distinguishing feature is a pronunciation guide that measures and scores the sound of your pronunciations against the correct pronunciations. We found this scoring method quite helpful because it provides immediate and repeated feedback during the learning process.

TeLL me More is available in four languages: Spanish, French, German, and Italian. It retails for less than $70 and comes with a free headset.

COOL 3D Has Hot Special Effects

While browsing the Web, most avid surfers used to be able to look at the quality of the graphics that accompanied the online text and tell the difference between which sites were created by pros and which were constructed by amateurs. That's not the case anymore. With the release of low-priced, high-powered graphics applications, such as Ulead Systems' COOL 3D 2.5, the average person can design professional-quality images on a standard desktop PC.

COOL 3D retails for $49.95 or costs $39.95 when users download it directly from the Ulead site. We found it to be a robust design tool and fairly easy to use. COOL 3D helps users to create three-dimensional (3-D) and animated images for use in documents, Web sites, and multimedia presentations. It combines seven toolbars, a library with more than 5,500 design options, and an intuitive interface to simplify the process of creating these images.

The program's success hinges on the EasyPalette, an array of preset designs that automatically adapt to fit the form of the text or images you're trying to create. The EasyPalette designs are divided into six folders: Object Style, Template, Camera, Backgrounds, Object Effects, and Global Effects.

Object Style contains bevel, light and color, texture, and motion options. Template includes complete objects and compositions that users can quickly customize. Camera contains various zoom options. Backgrounds is exactly what it implies. Object Effects offers 10 subfolders of special effects, including Bend, Dance, Twist, and Explosion. And Global Effects provides four more subfolders of special effects, including Shadow, Glow, Motion Blur, and Fire.

COOL 3D also features advanced customization options that are accessible through the Animation, Attributes, Location, and Text toolbars. You can use these toolbars to manipulate the on-screen playback of animated items, alter the various attributes of the graphics you create, reposition the objects on-screen, and edit the text you've created.

We used COOL 3D to create an animated title for a personal Web page. After entering the designated text and selecting a font style and size, we browsed the EasyPalette to find an object style and background. To attract attention to our title, we used one of the special effects in the Fire subfolder. Next, we used the Attributes toolbar to adjust the strength, amplitude, direction, length, opacity, and colors of the flames. Finally, we employed the Animation toolbar to control the way the title would appear on-screen as it burned.

The entire process of installing the application, checking out the features, and creating our title took less than an hour. Once we learned the ropes, we were able to construct additional animated titles in a matter of minutes. We tested the application on a Gateway PC that had a 166MHz MMX processor and 32 megabytes (MB) of random access memory (RAM), which matched COOL 3D's minimum system recommendations. We wouldn't recommend trying to run COOL 3D on anything less because even our computer encountered plenty of downtime while trying to chug its way through the 3D animation.

COOL 3D has more than 5,500 built-in options. For example, you can customize one of its fiery special effects to match your design needs.

MagicalDesk combines your E-mail inbox, online files, a Web browser, and as many as 14 other customized components in one convenient interface.

Access Your Files Magically

Thanks to a new product from Magically Inc., you can access your desktop from any PC. MagicalDesk is a virtual desktop that provides universal access to your E-mail account, calendar, address book, Internet bookmarks, and as much as five megabytes (MB) of personal data files. By offering free online storage space, MagicalDesk sets itself apart from the dozens of portals that provide Web-based E-mail accounts and other services.

To use MagicalDesk, you must first upload files directly from your PC to the MagicalDesk server. Then, designate whether you want the files stored in a private folder (accessible only by you) or in a public folder (open to anyone online). You can upload any sort of file, including text documents, multimedia files, and Hypertext Markup Language (HTML) pages.

Another intriguing component is the MagicalViewer, a MagicalDesk premium service that allows you to view files for more than 250 applications. For example, MagicalViewer allows you to view Microsoft Word, WordPerfect, Lotus 1-2-3, Microsoft Excel, Microsoft PowerPoint, and Microsoft Access documents in your Web browser window, even if you don't have these applications loaded on the PC you're using.

The virtual desktop runs on top of your Microsoft or Netscape browser and provides one-click access to your E-mail inbox, calendar, search engine, data files, and as many as 14 other customized components and Web sites. Unlike similar products, such as HotOffice, MagicalDesk is free to anyone who registers at the MagicalDesk Web site. The MagicalViewer premium service is free for the first 90 days, then it costs $5 per month to continue to use it. Users may also purchase any of the other premium services, such as additional online storage space and additional E-mail addresses, for a small monthly fee.

Caught Up In NetCaptor

Surfing the Web—jumping capriciously from one site to another—isn't as popular as it once was. As the Internet becomes more of a tool than a novelty, active users are growing increasingly more selective about the sites they visit online. This trend has led to what some people refer to as the "Rule of 90-10," which states that 90% of your online time is spent at 10 sites.

Stilesoft has taken advantage of this rule and released a browsing product called NetCaptor. And, unlike most of the products we've seen that claim to expedite the process of Web browsing, this one actually works.

The key to NetCaptor's speed is its CaptorGroup feature that allows users to browse the Web in groups of sites. When you open a CaptorGroup, NetCaptor accesses all the sites contained within that group. To view one of these sites, click its corresponding page tab at the bottom of the NetCaptor browsing field. The site, which NetCaptor originally downloaded to your PC when you opened the CaptorGroup, then appears immediately in the browser window. Although it might take a few seconds to download all the pages in your CaptorGroup, we didn't find ourselves inconvenienced by the loading speed.

NetCaptor makes switching among sites as easy as flipping the channel on your TV.

Also, creating a CaptorGroup is easy. We especially liked NetCaptor's ability to browse several sites simultaneously. For example, we were able to click a hyperlink at the Smart Computing site, and while we waited for that item to open, we switched to CNN Interactive to scan the day's headlines.

Users can also configure NetCaptor to support their Microsoft E-mail program and newsgroup reader. Plus, it automatically imports bookmarks from Internet Explorer and features a PopupCaptor that eliminates those annoying pop-up windows some sites unleash on unsuspecting visitors.

NetCaptor's intuitive interface resembles Internet Explorer, which isn't surprising since you must have Internet Explorer 4.0 or newer if you want to use NetCaptor. You can download a freeware version of NetCaptor from the Stilesoft site. To avoid the on-the-interface advertisement, pay $19.95 for an ad-free version.

Hardware

If the 550 megahertz (MHz) Pentium III processors Intel currently offers are just too darn slow for your computing needs, you might check out the 600MHz Cool K6-III with Cool Cache package due in August from the speed-hungry folks at KryoTech Inc. Equipped with an AMD-K6 III processor that normally runs at 450MHz, the system uses a cooling unit that drops the temperature of the processor to -40 Celsius, thermally accelerating the chip's speed to 600MHz. The $1,250 unit arrives in a bare-bones configuration that includes a motherboard, case, 300-watt power supply, and cooling system. There are also 64 kilobytes (KB) of Level 1 cache and 256KB of Level 2 cache. That means speed freaks will have to install a hard drive, monitor, and all other necessary hardware, as well as an operating system and applications, to fashion a usable system. (877/579-6832, 803/926-0066; http://www .kryotech.com). ▶ A new service and device from FlashNet Communications lets you enjoy most features of E-mail without a PC or Internet connection. The MailStation device is a keyboard and a small, monochrome display that uses an icon-driven interface. You sign up for the service, connect the device's modem to your phone line, and you're ready to start sending and receiving E-mail messages. The service costs new FlashNet clients $9.95 a month for the first two E-mail accounts, and current customers of the Internet
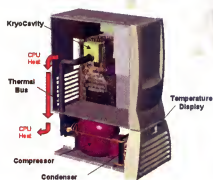
KryoTech's 600MHz Cool K6-III

service provider get a discounted rate. The MailStation unit sells for $129.95 at the FlashNet Web site. (800/352-7420, 972/299-9399; http://www.flash .net). ▶ Casio calls its new Cassiopeia E105 palm-sized PC a "multimedia powerhouse." That might be a bit of an overstatement, but the Windows CE-based unit does offer a 65,536 color display, stereo sound (via headphones), and Internet connectivity through an optional 56 kilobits-per-second modem. The $600 unit has a 131 MHz NEC processor, 32 megabytes (MB) of RAM, and 16MB of ROM. (888/204-7765, 973/252-7570; http:// www.casio.com/hpc/).

Software & Services

You can keep your published Web graphics safe from unauthorized copying with the SafeImage application from SafeMedia. The program works by using several protective methods to prevent others from using your images. Those methods include encoding owner-specific data to prevent display on other Web pages, and eliminating the mouse right-click-to-save feature that lets visitors copy elements from a Web page. The program also utilizes watermarking technology to embed copyright information into a digital image, audio, or video file through the insertion of a bit pattern. A software license for networked users with more than one Web page registered to a single Internet domain sells for $299, while a host license for a single Web site costs $99 (800/996-4397; info@safemedia.com, http://www.safemedia.com). ▶ A new service from Oyster Communications lets you get a quick, no-nonsense rating

on your credit status, and also offers pointers on how to improve less-than-perfect report scores. The How's My Credit? service pulls credit reports from Trans Union Corp., one of the three credit bureaus (the others are Equifax and Experion), and presents a score similar to the ratings used by lenders and banks in addition to up to four suggestions and credit-use pattern observations. The $15.95 service gives small business owners looking for a loan an idea of how lending officials might view a credit report. Oyster says it will not sell or reuse any information provided by the customer or contained on the report. The company uses a secure server you can access for 30 days after purchasing the service (303/797-3734; http://www.oystercommunications.com). ▶ Site Monster 1.0 from Pacific Software Publishing Inc. lets you make sure your Web page is up and running, even when you're away from your PC. The software performs user-scheduled or automatic visits to a Web site, and if it cannot access a site, it sends a

Site Monster monitors your Web site.

text-based notification via pager, E-mail, or cellular phone to notify you of the problem. When viewing the software at work on your PC, red, yellow, and green indicators on the Site Monster's window indicate the status of each site check. Green means a successful check, yellow means one failed connection attempt, and red means two or more unsuccessful attempts to access the page. The program also lists possible reasons for the breakdown at each site registered with Site Monster (800/232-3989, 425/497-8080; http://www.sitemonster.com).

Insights Into Outlook Express

The Internet is useful for many reasons, but its most popular use has to be E-mail. Billions of E-mails zip around the world each year. It's easy to understand why E-mail is such a popular way to convey information. It's cheap, fast, versatile, and convenient. In most cases you only have to pay for your Internet connection. You can send E-mail free of charge; you don't even have to pay for a stamp. It's easy to use and only takes a few minutes to send a message anywhere in the world. Best of all, you can send pictures, documents, and links to Web sites all through E-mail.

Before you can send E-mail, however, you need to have an E-mail client. An E-mail client is the program you use to write, send, and receive E-mail messages. Qualcomm's Eudora, Netscape Messenger, and Microsoft Outlook are some of the most popular E-mail clients, although there are many more available.

You have to pay for some E-mail clients. The full version of Eudora, for example, will run you $39. The price for Microsoft Outlook 2000 is a very hefty $109. Or you can get Outlook 2000 when you purchase one of the Office 2000 suites, which range from $249 to $499.

"Wait a minute!" you say, "I thought you said E-mail was cheap!" So we did. You don't have to dig into your savings account to buy an E-mail client. You can get one that doesn't cost anything. Eudora offers a "Light" version that you can download for free at http://www.eudora.com. Netscape's Messenger comes with Communicator, also a free download at http://www.netscape.com/computing/download. As for Outlook, if you have Windows

98 (Win98) or Microsoft Internet Explorer (version 4 or 5, available at http://www.microsoft.com/downloads), you already have Outlook's little brother, Outlook Express.

As with Internet browsers, finding an E-mail client that's right for you is largely a matter of taste. The ones we've mentioned have similar interfaces. Composing, sending, and reading E-mail is as easy in one as in the others.
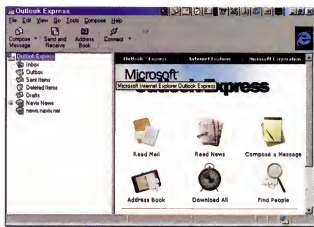
Outlook Express lets you compose, send, and receive E-mail easily.

Outlook Express, however, has one advantage over the others we've mentioned. You may not use Netscape, you may not own Eudora, but you almost certainly have Outlook Express already installed on your computer. And if you do, it doesn't take long to set it up, so you may as well check it out to see if it suits your fancy.

The Outlook On Outlook

The first thing to note is there are a couple of different versions of Outlook Express available. If you use the original version of Win98, or Internet Explorer (IE) 4, you'll be using Outlook Express 4. If you

upgraded to Win98 Second Edition, or if you've installed IE 5, you'll be using the latest version of Outlook Express, version 5.

Outlook Express 5 has a few new features some users will find helpful or interesting. Perhaps the best new addition is the ability to synchronize your Hotmail account with Outlook Express. Hotmail is Microsoft's Web-based E-mail service, and this synchronization lets you share information between your Hotmail account and your Internet service provider (ISP) account that you access with Outlook Express 5. This can be especially helpful if you travel a lot and your only means of checking E-mail is using easy access to the Web.

Outlook Express 5 may have more options than Outlook Express 4, but most users can get by with either version. Those who are looking for even more tools in an E-mail client might want to consider upgrading to Outlook 98 or 2000. These versions of Outlook include other features, such as a calendar and electronic "sticky notes." Of course, to get Outlook 2000, you have to pay for it, and we've already gawked at what that will cost you. Outlook Express is free, and will easily take care of your E-mail needs.

The interface for Outlook Express isn't especially slick or fancy, but it doesn't need to be. Writing, sending, and receiving E-mail with the program is intuitive, as it is with any respectable E-mail client. The address book is easy to use and lets you store plenty of information about your contacts. Outlook Express also has a preview pane option, which lets you view the contents of an E-mail message without opening it first. Furthermore, you can assign rules to incoming messages. For example, you can set the program to automatically

delete messages from a certain sender, or move certain messages to a specific folder. This helps you organize your E-mail more efficiently.

The E-mail capabilities are Outlook Express's main job, but it also pulls double duty as a news client. A news client is a tool that lets you view and post messages in newsgroups. A newsgroup is a virtual area reserved for the discussion of certain topics. There are newsgroups about nearly every topic imaginable, from movies to fine food to genealogy. You can subscribe to any of the thousands of newsgroups available and read the opinions of others on a given topic. You can also post your own thoughts.

The news client looks very similar to the interface for the inbox in Outlook Express. This familiarity makes reading and posting messages quite easy. As with E-mail, you can view posted messages in a preview pane, so you can glance at the text without having to open up the posted message.

Hook Up To Outlook

Of course, before you can use all these cool features to send and receive E-mail or read posted messages in newsgroups, you have to set up Outlook Express. You don't need a screwdriver, but you will need some basic information about your ISP. Follow these instructions to install Outlook Express 5 on your system.

You need to set up the connection options for Outlook Express before you use it. This guide should work in most instances. Open Outlook Express and click Tools in the Menu bar. Now click Accounts. This will open the Internet Account dialog box. Click the Add button, then Mail, to start the Internet Connection Wizard.

The first step in the Wizard is to enter your name. Click the Next button at the bottom of the dialog box. Now, enter your E-mail address

in the appropriate field and click Next again. Check with your ISP if you don't know your E-mail address.

Now it starts getting just a little tricky. This section of the wizard requires information about your ISP's mail server, which is where your service stores E-mails sent to you until you download them in Outlook Express. Your ISP should provide you
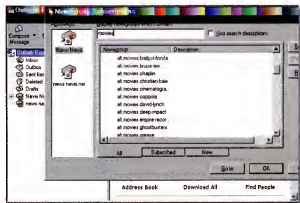
Internet newsgroups related to nearly any topic are part of the information you can reach through Outlook Express.

with all of this information, but you can try some educated guesses if you're not sure about the information.

The first choice you have to make is what kind of mail server your ISP uses. Click the down arrow in the drop-down list box and choose POP3. In the next field, you need to enter the incoming mail server. That information will look something like this: mail.yourisp.net. Enter the same information in the Outgoing Mail server field. Click the Next button at the bottom of the dialog box.

The next section requires you to fill in your account name and password, which your ISP should have also provided during sign up. Click the Remember Password box after you fill in this information, and click the Next button. That should be it. Click the Finish button, and you're ready to go.

If you are setting up Outlook Express 4, you will have a couple of extra steps from this point. After you finish filling out your account name and password, you'll move on to the

Friendly Name section of the wizard. All you have to do here is enter a name for your E-mail account, such as My E-mail, or whatever you like.

Next you'll be asked how you want to connect to the Internet. If you're using a single computer with a modem, select Connect Using My Phone Line. Click the Next button.

Following this is the Dial-up Connection section. If you already have a Dial-up Connection set up for your Internet connection, choose Use Existing, click Next, and you're done.

If you don't have a Dial-up connection, you'll need to set one up. Choose Create a new dial-up connection and click the Next button. Enter the phone number for your ISP. It should be the same number you use for your Internet connection. Click Next, and enter your user ID and password. Click the Next button again. Here, you'll be asked if you want to mess with the Advanced settings. Click No and the Next button. Now you'll be asked to enter a name for the Connection you've created. Once that's done, click Next and then click the Finish button. Once that's done, you should be set up. Go E-mail somebody.

You can use the same Wizard and follow the same processes to set up your news account. The only difference is you'll want to enter news.yourisp.net, rather than mail.yourisp.net. Once you've set up your news account, you'll be able to download and search the world of newsgroups.

E-mail has become an indispensable means of communicating with others. Given its simplicity, convenience, and affordability, it's hard to imagine how we ever got along without it. There are several free E-mail clients around, but Outlook Express may be the best choice for you. The only way to find out is to try it out for yourself. ∎

by Michael Sweet

Windows 98 Second Edition

By the time you read this, the second edition of Windows 98 should be shipping with new PCs and available for purchase. It's not a radical redesign of the operating system; rather, it's a refinement bundled with some new interconnection features. Because all but one of the new programs, patches, and bug fixes are already available to present Windows 98 users for free download (via the Update feature), you'll probably only buy it for the Internet Connection Sharing feature.

New Features

This upgrade of the popular operating system (OS) offers expanded support for Universal Serial Bus (USB) peripherals, such as modems; IEEE-1394 "FireWire" (a specification for a high-speed external bus used to connect peripherals) devices, such as digital camcorders; and high-speed broadband Internet connections, such as Asymmetric Digital Subscriber Line (ADSL), Integrated Services Digital Network (ISDN), and cable modems. Windows 98 Second Edition (Win98 SE) also includes Advanced Configuration and Power Interface (ACPI), which means it can regulate the amount of power sent to various devices in the computer. You will also have built-in support if you ever decide to install a device bay, which allows hot-swapping compatible devices.

Business users and large families will welcome the inclusion of NetMeeting 3. This is the latest version of an application that allows you to hold video and audio conferences on the Internet. You even can collaborate on shared documents while online. Microsoft claims NetMeeting 3 offers more security, better and friendlier operation, and support for more Internet standards.

The unreleased Windows 98 Service Pack is incorporated into Win98 SE. It contains updates for year 2000 issues and other bugs. It's a convenient organization of the patches available through Update.

Win98 SE also includes Internet Explorer 5, which is faster and more flexible in its operation. This browser seems to anticipate what you're looking for, or what you're in the middle of typing, and can suggest related topics. However, it's large enough (8.2MB, expands to 17MB) to make you think twice about downloading it for free.

Other additions are broader WebTV support, DirectX 6.1 for multimedia performance, and Windows Media Player 6.1.

Internet Connection Sharing

One new feature you won't be able to download for free is Internet Connection Sharing (ICS). This add-on to the Internet Options Control Panel takes aim at simplifying small-network configuration, and enabling that network to share the best Internet connection.

ICS's first function automatically assigns Internet Protocol (IP) addresses to the computers in a local-area network (LAN), as long as each uses Windows 95, Windows 98, Windows NT, or Windows 2000 and **Transmission Control Protocol/ Internet Protocol** (TCP/IP; a language that governs communications among all computers on the Internet). This eases network setup tremendously.

The second function puts Internet Connection Sharing into practice. Desktop PCs in a small LAN will be able to use the fastest Internet connection in the office. If one PC has access to a T1 line, every PC can share it.

Prices & Purchasing

Win98 SE is available pre-installed on new systems, and is available through retail channels for Windows 3.x and Windows 95 users ($109 MSRP). Present Win98 users get a pricing break. If you order the Win98 SE CD-ROM by phone (the number was unavailable as of press time) or through the Web site (http://www .microsoft.com/windows98), you'll pay only $19.95 plus shipping and handling.

Even at this price, you're still paying for a lot of functions that you could download for free, but you will get ICS and you won't have to pay the Internet fees for a download that will take several hours. In addition, many users feel more comfortable with a CD-ROM and the documentation that comes with it.

Although Win98 SE will replace the old version of Win98 on retailer's shelves, the package is still considered an "upgrade." You'll have to have your old Windows 3.x diskettes or Win9x CD-ROMs handy for verification when
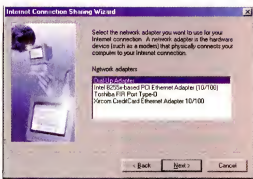
The Internet Connection Sharing Wizard will take most of the work out of networking.

you begin installing Win98 SE. (*NOTE: This also means someone building a system from scratch will need to install one of these OSes before Win98 SE.*)

If you aren't planning to make the jump to Windows 2000 when it becomes available, and you're wary of the ever-shifting rumors about any future Microsoft OS based on the 9x kernel, Win98 SE is a sensible investment. This is also true for Windows 3.x and Win95 users. But Win98 users who regularly download Microsoft Updates and don't care about networking will probably pass. ∎

by Marty Sems

*I wish
my older dog
could leap to
his heart's
desire.*

AT PURINA, WE'RE IN THE BUSINESS OF MAKING WISHES COME TRUE.

Conventional wisdom held that older dogs needed less protein in their diet. But lifelong studies at the Purina Pet Care Center led Purina scientists to a different conclusion. In fact, a diet rich in protein can actually help older dogs stay stronger longer. This discovery led to the creation of Ulti-Pro™, the enhanced protein system now at work in all Purina® brand senior diets. And because Ulti-Pro also helps dogs retain lean muscle as they trim excess fat, you'll find it at work in all Purina weight management products. Purina discoveries like Ulti-Pro significantly raise the standards of care for our pets. And that inspires us to reach even further for the next scientific breakthrough.

PURINA

Redefining *the* Possible

Windows NT Service & Option Packs

You don't buy an operating system. Rather, you buy a license to use a work in progress. Microsoft has released four Service Packs and one Option Pack to refine Windows NT 4.0 since its debut. Here, we look at the features of the available packs.

Which Is Which

A Service Pack is a collection of Updates, new device drivers, and other software. If you're a registered

Microsoft recommends you explore Service Pack 5's features before you decide to install it.

Windows NT user, you can download them for free, or you can get a CD-ROM with documentation for $19.95. (*NOTE: When your WinNT is loading, the top of your screen will tell you which WinNT version and Service Pack you have, if any.*)

An Option Pack is a group of optional utilities and applications. The single WinNT 4.0 Option Pack is only available for download.

In general, WinNT Service Packs incorporate all the features of previous Service Packs, so it isn't necessary to install each one when you upgrade. For example, you can install Service Pack 5 over the top of Service Pack 3 and get all the benefits of Service Pack 4.

Some WinNT Service and Option Packs are targeted toward Workstation,

Server, and/or Enterprise editions. (If you don't know which edition you have, watch for a title screen when WinNT boots up.)

You can find most of these downloads at http:// www.microsoft.com/ windows/downloads/winntw.asp.

WinNT 4.0 Service Pack 5 is the latest Service Pack for WinNT 4.0 and may be the last before the release of Windows 2000. Its major features include: all of Service Pack 4; year 2000 updates for Internet-related applications, such as Internet Information Server 4.0 and Message Queue; and other Y2K fixes for System Time and Internet Explorer 4.01 Service Pack 1 (in effect, patching this patch).

It also includes fixes for security, memory, networking, and performance issues.

Service Pack 5 is available in different versions for WinNT 4.0 systems with 40-bit or 128-bit encryption. To determine which one you have, open My Computer, select View, Options, the View tab, Show All Files, and then click OK. Next, click Start, Programs, Windows NT Explorer, the Winnt folder, and System32. Right-click Schannel.dll, select Properties and the Version tab, and read its description. Export versions are 40-bit while domestic versions are 128-bit. You can download either version's Service Pack 5 from http://www.microsoft.com/nts erver/n t s /downloads/recommended/sp5/allsp5.asp.

Service Pack 5 is not compatible with WinNT 4.0 Terminal Server Edition. Its latest update is Service Pack 4 for Terminal Server and is available at http://www.microsoft .com/NTServer/all/downloads .asp?MSCOMTB=ICP_Downloads.

WinNT 4.0 Service Pack 4 is a vast improvement over Service Pack 3. It includes: all of Service Pack 3; Windows NT Support Tools (for easier analysis of memory dumps after crashes); simplified network administration, including Web-Based Enter-prise Management (WBEM); and Security Configuration Editor and other security enhancements.

Service Pack 4 also includes support for the Euro currency symbol; Y2K updates for User Manager, Date/Time, Find Files, and others; Internet Explorer 4.01 with Service Pack 1; and updates for the WinNT 4.0 Option Pack.

WinNT 4.0 Post Service Pack 4 Year 2000 Update fixes many Y2K issues for Service Pack 4 users without making them upgrade to Service Pack 5.

WinNT 4.0 Service Pack 3, in the Archive section of the download page, includes: Service Packs 1 and 2; enhancements to Internet Information Server; security improvements, such as password filtering and system keys; and broader application programming interface (API) support.

WinNT 4.0 Post Service Pack 3 Year 2000 Update fixes Y2K issues for Service Pack 3 users without making them upgrade to Service Pack 4.

WinNT 4.0 Option Pack (requires Internet Explorer 4.01 and WinNT 4.0's Service Pack 3) is a collection of programs that help establish a functional Web presence for your business. It includes server applications for dealing with information requests and online transactions.

Be sure to examine the features of any potential upgrade before you install. If you don't see anything you need in a Service Pack, you may want to download only the separate, critical Updates you need. (You can't install only certain parts of a Service Pack; it's all or nothing.)

Even though the download may be free, a Service Pack could conceivably introduce new problems into your system or simply waste space on your hard drive. ∎

by Marty Sems

Learn how to use the DOS, Windows 3.1, Windows 95, and Windows 98 operating systems with our easy-to-use tutorials.

Copying Files

W orking with a copy machine almost always means you'll eventually be reaching inside the guts of a copy machine with inky fingers to retrieve your valued documents. Fortunately, copying electronic files is a lot easier.

MS-DOS 6.22

Like most DOS commands, copying files is considerably easier than Windows operations, as long as you know the exact letters to type on the command line.

At the command line prompt, type the letter of the drive in which the file you wish to copy resides. Do not go to the drive in which you want to place a copy of the file. If the original file is on a diskette, type a:\ to access the diskette drive. If it is not on a diskette, type c:\ to access the hard drive. Once the C: drive command line appears, type dir to view the contents of the drive. You should see your sought-after file among a list of others. In the column directly to the right of the file names, another list shows each file's file type, or extension. These file extensions can be BAT or TXT to name a couple, or perhaps nothing at all. Now type:

copy <filename.extension> <directory to receive a file copy>

For example, we wanted to copy the file Smartcom from the hard drive onto a diskette in the A drive. We typed copy smartcom a:\. Since our file had no file extension, we left out that part of the command. In response to your command, the computer will display, "1 file(s) copied."

Now you have two copies of the file; one in the original location and a copy in another location. To make sure you have successfully copied the file, look at the new directory listing. Type the letter of the copied file's directory at the command line. For example, we typed a:\ to access our updated diskette. Type dir to see a directory list of the drive's contents. If you see the file in the directory list of the drive, you have copied the file.

Windows 3.1

Windows 3.1 (Win3.x) makes the user work a little harder to copy files. Within the Program Manager window, double-click the Main icon. The Main folder's window will appear, with a File Manager icon inside. Double-click File Manager to access your computer's files.

The File Manager window will display the various drives for you to access beneath the menu bar. You will most likely see an A: (diskette) and C: (hard) drive. Select the drive in which your file resides. A list of that drive's contents will appear on the left portion of the window. Click the correct folder (known as a directory in MS-DOS), and your file will appear among a list of other files in that folder, on the right half of the window.

Highlight the file you wish to copy by clicking it once. Click the File menu and then select Copy. A dialog box will appear, asking to which folder you want to send the file. In the box to the right of "To:," type the letter drive to which you wish to send a copy, such as "c:\.," followed by the folder, if necessary. Press ENTER or click OK, and you will have made a copy of the file. If you click, drag, and drop the file into its desired destination, you will move the file, but not make a copy of it. Hold down the CTRL button while dragging within the same drive to make a copy.

Windows 95

Windows 95 is more user friendly than Win3.x. Access a listing of files on your system by right-clicking the Start menu and selecting Explore. This screen will resemble Win3.x's File Manager and functions similarly. Double-click the correct folder on the left, and its contents will appear in a list on the right side of the screen divider. Your file should appear in the list. If it doesn't, then it's a subdirectory within another directory. Click the plus sign beside the correct directory, which will open to show its subdirectories.

Now that you have accessed the file, click it to highlight it. Click Edit on the menu bar and select Copy from the list of commands. Now highlight the drive or folder in which you want to make a copy. This will be in the list on the left. Click Edit again and select Paste. You now have a duplicate copy of the file. Repeat the Paste operation for other drives or folders you wish to have copies of the file.

If you do not want to mess with Windows Explorer, you can open the directory window of the desired file from the Desktop. If it does not have its own icon directly on the desktop, double- click My Computer and find it within the contents. Click the Edit menu, then Copy. Now open the folder into which you wish to copy the file. Click Edit and Paste. If you do not want to mess with the Edit menu, you can right-click a file's icon and select Copy. Now right-click the destination folder or drive and select Paste. Again, if you click,

drag, and drop the file into a new folder within the same directory, you will end up moving the file instead of making a copy. Hold down CTRL while dragging to make a copy.

To copy a file to or from a diskette, you can drag the file from one drive's window to another. Open the folder in which the file is saved and also open the destination folder. You can access these from the My Computer icon on your Desktop. Double-click the icon and double-click the folders from the ensuing list of contents. To copy a file from a diskette onto your hard drive, open the A: drive and locate the file. Now open the directory or folder into which you want to copy the file. Drag the file icon into the new directory or folder. Now you have two copies of the file. Clicking and dragging to make a copy only works when one of the directories is a diskette, otherwise you must hold down the CTRL key while dragging and dropping to make a copy.

If you wish to make multiple copies of a single file, you can bypass the click and drag operation. Highlight the

correct file on the right window of Explorer with a click. Select Edit from the toolbar menu and select Copy. Now select the destination directory or folder and select Paste from the Edit menu. Repeat the Paste function for each destination into which you want to place a copy of the file.

Windows 98

Windows 98 offers the same copying options as Win95, but with a perk. You can click and drag to copy a file even when an external diskette is not involved. Simply click and drag the file icon into the new directory or folder, and you will have two copies of the file. There are, however, a few exceptions in which you will actually move the file instead of copying it. If you drag it into the Recycle Bin, you will not make a copy of it. Nor will you copy it if you drag it into a subfolder of its original location.

Cutting &
Pasting Selections

O ne of the biggest advantages of the computer age is that we no longer have to wear out our erasers eliminating a sentence or two, only to write it down again elsewhere. With DOS and Windows PCs, we can cut and paste words from one location to another with nothing more than a short command or a click of the mouse.

MS-DOS 6.22

In the text editor application (which can double as a poor makeshift word processor) called MS-DOS Editor, the hard part is selecting the text to cut and paste. Use the arrow keys to place your cursor on the first character on the left or one space to the right of the last character of the portion you want to cut. Press the SHIFT-Left or Right arrow keys to select letters, SHIFT-CTRL-Left or Right arrow keys to select words, and SHIFT-CTRL-HOME or END to select everything from the cursor to the beginning or end of the file. Once you have the designated portion highlighted, press ALT-E to access the Edit menu, and then select Cut or press T. The entire highlighted portion

will disappear. Now move your cursor to the location where you wish to paste the text you just erased. In MS-DOS 6.22, you must paste within the same document from which you cut. Go into the Edit menu by pressing ALT-E, and press P to paste the portion you cut. You can paste it multiple times. The keys you press may vary among applications. For example, in word processors you press CTRL-V to paste.

Windows 3.1

Win3.x brings even more cutting and pasting freedom than MS-DOS 6.22 in its included word processing application MS Write. In order to cut a selection, click and drag your mouse across the text you want to erase until you have highlighted the entire portion. Click Edit and select Cut. Now move the cursor to the location in which you wish to paste the portion you cut. It can be in a separate document, or any other location within the same document. Click Edit again and select Paste. Like MS-DOS 6.22, you can paste the application as many times as you want.

Windows 95/98

To cut and paste text within Windows 95/98 (Win9x), click and drag the mouse across the selection you want to cut to highlight it. Right-click the text and select Cut, or select Cut from the Edit menu. Now move the cursor to the point where you want to move the text, either in the same document or in another one. Right-click and select Paste, or select Paste from the Edit menu. You may choose to paste the same piece of text multiple times.

Changing Desktop Colors & Designs

I f you have never changed your desktop color, you've probably gotten tired of looking at the same screen color every time you turn on your computer. Any color or design, from plain white to pink polka dots, gets old after awhile. Unfortunately, the last time you altered your desktop display was probably so long ago you can't remember how you did it. We're here to help you out.

MS-DOS 6.22

Although most people spend as little time as possible in front of a DOS command line, those that do type a lot of commands soon tire of the black screen and grayish text. To get around this, you must first install Ansi.sys, a program that allows you to change background and text colors in MS-DOS. At the command line prompt, type edit config.sys. This accesses MS-DOS's configuration file that is read by the system every time it boots up. Press ENTER at the end of the last command listed to place the cursor at the beginning of a new line.

Type device=c:\dos\ansi.sys to load Ansi.sys. Press ALT-F to access the File menu followed by ALT-S to save the file. Now press ALT-F again and ALT-X to exit. Reboot your computer so DOS reads the new configuration changes.

Now your computer has the capability to change screen colors in the foreground and the background. At the C:\> command prompt, type prompt=$e[<text color>;<background color>mpg. The "$e[" warns the computer an Ansi.sys command is about to follow, "m" ends the alterations, and "pg" tells the computer to continue prompting commands with "C:\>."

All that's left to do is choose your colors. For the text color, type the number 30 for black, 37 for white, 31 for red, 34 for blue, or 32 for green. For the background color, type 40 for black, 47 for white, 41 for red, 44 for blue, or 42 for green. There are many more options, but we think that listing more color codes would make things too difficult to remember.

For example, if you want to see white text on a blue screen, type prompt=$e[37;44m$p$g. Now type cls to clear the screen and fill it with its new hues.

Windows 3.1

With the creation of Microsoft Windows comes the array of Desktop colors. To access this palette, double-click on the Main icon from within the Program Manager. Double-click on the Control Panel, and then the Color icon. This opens a Color window with a Color Palette>> button near its base. Click this button to access the Screen Element heading on the upper left portion of the window. Press the down arrow button to the right of the selected screen element until you have selected Desktop. Choosing another screen element will allow you to alter another aspect of your screen image, such as text or the menu bars. Click the desired color on the color palette beneath the Basic Colors title. Click OK, and the window will close to unveil a new screen shade.

If you are tired of the basic colors Win3.x offers, you can create your own pattern within the Color Palette. Beneath the Basic Colors section is a Custom Colors palette, which has 16 blank squares beneath it for you to fill in with your own patterns. Click Define Custom Colors beneath the squares. Now you'll see the Custom Color Selector window. Click and drag the button beside the color strip to the right of the big block of color to lighten or darken the color. Click the up and down arrows next to Hue, Sat (color saturation), Lum (luminosity), Red, Green, and Blue to alter your pattern. Now click on an empty box under the Custom Colors heading on the right and click the Add Color button on the left.

If you don't trust your own artistic abilities, Win3.x has its own patterns from which you may choose. Instead of the Color Palette, click on the Desktop icon in the Control Panel. The Desktop window will appear with two notable boxes: Pattern, in the upper-left corner of the window; and Wallpaper, near the lower left. Select the pattern you want by clicking the arrow to the right of the pattern listed until your desired pattern name appears. Now click the Edit Pattern button beneath the name to see an example of it. Click OK to exit the Edit Pattern box and OK again to close the Desktop window and view your desktop's new look.

The Wallpaper box in the Desktop window offers more patterns but also the option of one image on top of your existing desktop shade. You can select an option the same way you did in the Pattern box, but you do not have the equivalent of the Edit Pattern box. Click Tile if you want the image to appear multiple times as a pattern across your screen, or Center if you want a single image centered on your Desktop. If you click Center, your previous desktop pattern or color will remain the same, surrounding your center image. Now click OK to save your alterations and exit the Desktop window.

Windows 95

Win95 offers a similar solution to aid your color-weary eyes. Click the Start menu, click Settings, select Control Panel, and double-click Display. This opens the Display

Properties window, in which you should click the Appearance tab. Near the bottom right of the window you will see a Color box. The current desktop color shows up in the box. Click the down arrow button to its right to select a new color. Click Apply or OK, and the Windows Desktop will have a new look.

To give your Desktop a pattern, select the Background tab within the Display Properties window. Halfway down this window is a Pattern button. Click it, highlight the pattern you like, and click OK. Highlight the picture you want to use. To the bottom right of this list is another set of options under Display. Select Tile or Center beneath the Display heading to specify how you want the pattern to spread across the screen. Click Apply and then OK to close the window.

Windows 98

Win98 functions nearly identically to Win95 in terms of Desktop colors and patterns, while offering a few more options. Instead of a Pattern button, Win98 displays a list of patterns from which to choose directly on the Background tab. It also adds Stretch to Tile and Center, bringing the list of options on how you want to display your pattern to three.

Removing Fonts

Few of us realize that stuffing a PC with hundreds of fonts can use up your computer's storage space. If you have too many fonts, you may have trouble opening programs because you'll run out of memory space. If you have too few fonts, you're probably missing the essential ones needed to open those same programs. There must be a happy medium.

Before you start happily deleting files, you should mark some as absolutely necessary. Your system needs some crucial fonts to function. Microsoft warns not to delete any fonts that originally came with your system. If you do not know which ones those are, do not delete fonts beginning with the letters MS. Do not delete True Type fonts, which are preceded by an icon with two blue T's or succeeded by the suffix TTF. If you use PowerPoint or Microsoft Office, do not delete Tahoma. If you do delete key fonts accidentally, you can replace them by re-installing Windows, or downloading them from the Web.
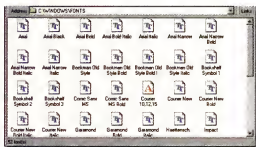
Do not delete fonts with the blue TT logo. Your system needs these True Type fonts to function.

DOS 6.22

DOS gives you no font options, so you don't have to worry about deleting the wrong ones. You're stuck with the same one forever.

Windows 3.1

Win3.x allows you to stockpile many fonts and then delete them later. From the Program Manager, double-click the Main icon. Now double-click the Control Panel within the Main window. Double-click Fonts to open the Fonts window. This displays a list called Installed Fonts, which are all the fonts your computer has stored. Highlight the one you want to delete and click Remove. Now click the Delete Font File From Disk box in the ensuing dialog box and click Yes To All or OK. You have successfully removed the font from your computer.

Windows 95/98

In Win9x, you'll also need to access the Control Panel to delete fonts. Click the Start menu, select Settings, and then Control Panel. Now double-click Fonts. Select the font to delete and open the File menu, then select Delete. A dialog box similar to the one in Win3.x will appear saying, "Are you sure you want to delete these fonts?" Click Yes or press ENTER.

You can delete multiple files simultaneously. Right-click and drag your mouse across a selection of fonts you wish to remove in the Fonts menu. When you lift your finger, a text-sensitive menu will appear with the option Delete listed. After clicking this, you will be asked if you really want to delete these fonts.

After weeding out all the space-hogging fonts, you'll have room to store more data on your computer. More importantly, you'll have room to start collecting more fun fonts. ∎

by Michelle Nelson

Broaden Your Horizons Online

Affordable Broadband Technologies Such As ISDN, DSL & Cable Modems Put High-Speed Internet Access Within Your Reach

AT LAST . . . you're finally able to upgrade your computer system and access the Internet via your new 56 kilobits per second (Kbps) modem. You know your new modem is much faster than the one you just upgraded from, but during your first trip online, you're disappointed as you watch photographs download slowly on-screen and E-mail messages trickle into your inbox one by one.

Meanwhile, your next-door neighbor also recently upgraded his Internet connection, but his connection zips along like a rocket compared to yours. With his access method, files download in seconds, Web pages appear on-screen instantly, and groups of new E-mail messages load from his Internet service provider's server in a mere fraction of the time it takes yours. Plus, he didn't have to buy an additional phone line to establish his speedy connection; he can talk on the phone and surf the Web at the same time.

Your neighbor has found the future of broadband transmission: when high-speed Internet connections are finally available to average consumers. For many of us, the future is already here. Depending on what part of the country you live in, you might already have access to three of the most common broadband services. The Integrated Services Digital Network (ISDN), Digital Subscriber Line (DSL), and cable modem Internet access methods are all relatively inexpensive and increasingly accessible nationwide.

And why should consumers care about broadband services? Broadband transmission is advantageous for Internet users because it lets several data streams transmit simultaneously over common communications lines. By accessing the Internet in this manner, broadband services can offer incredible speed and numerous other advantages over the traditional analog modem setup. Best of all, the installation and configuration of these methods do not require users to have unusual technical knowledge.

(NOTE: As we'll discuss later in this article, DSL comes in several different formats and is often referred to collectively as xDSL.)

Broadband Popularity

According to recent predictions, broadband services and their availability will continue to rise at an even faster pace in the near future. For example, a recent report from The Insight Research Corp. predicts that by the end of 1999, high-speed access providers will provide service to at least 14% of all American households. That calculates to about 14 million unit sales. The big question for consumers is which high-speed access provider will win the broadband battle—DSL or cable modems? Insight Research is unwilling to predict an exact outcome, but they do propose two scenarios.

In one scenario, Insight Research foresees more ability from major cable operators to achieve a massive deployment of digital set-top boxes and cable modems to consumers, as well as a faster time table for completing scheduled systems and network upgrades. This will result in a dramatic increase in the number of customers who choose cable modems over other Internet access methods. If this is the case, when analyzing the consumer numbers between 1998 and 2003, cable modems will grow from 4% of the Internet access market to a substantial 34% of the market. Using the same time frame, xDSL will increase from 1% to 25%, while ISDN will remain at 1%, and the other 40% of consumers will choose alternative access options.

Another possibility, according to Insight Research, revolves around whether the xDSL standard will be built into all computers that reach the marketplace in the near future. If this is the case, xDSL will rise in market share from 1% to 26% by the year 2003, whereas cable modems will increase from 4% to 28%, ISDN will remain at 1%, and the other 45% of consumers will choose alternative access options.

The Yankee Group is another source that predicts cable modems will have a slight edge over xDSL methods. According to a quote printed by the Dow Jones Newswires service (in June of 1998), the Yankee

Group predicts that by 2002, more than 3.35 million homes in the United States will access the Internet through cable modems in comparison to only 2.65 million U.S. homes using ADSL modems.

Still, not all experts agree about who will definitively win the broadband battle. Moreover, no matter which access method you prefer, all experts agree that you should analyze your current situation and future needs before considering one option over another. In this article, we provide in-depth information about these services, as well as the advantages and disadvantages of each. For more information about how to install these three access methods in your home, see "Installing More Broadband Power" in this issue.

ISDN Methodology

A couple of years ago, ISDN was touted as the consumer answer to speedy Internet access from home. That's not true anymore. But even though cable modems and DSL are taking over the market, ISDN is still a valid option for home and small office computer users, especially those who are too far away from the telephone company's central office to qualify for DSL service.

ISDN works over the telephone copper wire system that exists in most homes today. Basic Rate ISDN takes a telephone wire system and splits it into three channels, two of which are used to transmit data (known as B channels) in the form of voice or computer data at speeds of up to 64Kbps. Although that doesn't sound much faster than data transmitted by a 56Kbps modem, there are three important distinctions between these two types of connections.

One, when you dial into the server of your Internet service provider (ISP) with a standard 56Kbps modem, the connection uses all the line resources, so you can't talk on the telephone and surf the Web simultaneously. With ISDN, you can surf a company's Web site and, at the same time, discuss online documents with your client over the phone.

Two, although a 56Kbps modem ideally transmits data at a speed of 56 kilobits per second, line noise can slow that speed down dramatically. And three, ISDN channels can be bonded together to provide users with speeds of up to 128Kbps. For example, let's assume you need to use your ISDN service to conduct a videoconference. To do this, you can set up the ISDN line so that it combines the resources of all the channels to provide a smoother video and audio transmission. Then, once the videoconference is over, you can break the setup down and return again to your typical ISDN use.

Regarding setup arrangements, the ISDN configuration on the user end varies according to the ISDN provider and numerous other factors, such as distance from the provider and the age of the ISDN devices. As a result, there are many types of ISDN setups available. In the past two to three years, ISDN devices have integrated into different functionalities, and because of this, some setup arrangements might only require one device whereas others

with older equipment need two devices. Plus, even though the majority of ISDN vendors only offer an external ISDN setup, others offer internal ISDN devices upon request.

A typical ISDN setup, for the most part, requires a single line that runs from the phone jack in the wall to the network terminating device (NT1). This device is often referred to as a terminal adapter or modem, but the proper technical term is NT1. These devices resemble external modems and use a similar type of line, but in some cases, new wiring may be needed. In addition, NT1 devices usually require a RJ45 jack (connector) instead of the RJ11 jack that standard modems use. From the NT1, a cable runs to the COM port on the back of your computer where a network interface card (NIC) allows your computer to communicate with the NT1 device. The NT1 device itself also has two analog ports from which you can run lines to a telephone and fax machine.

On the checkbook side of an ISDN setup, we must warn you: all high-speed access methods come with a significant cost. You won't have to access the Internet from the poorhouse, but you will need to spend some cash to get a speedy connection online.

You'll pay a one-time installation charge for an ISDN setup, which can range anywhere from $100 to $300. Second, there's a fixed monthly charge for your ISDN line, and for this, you can expect to pay about $20 to $50 per month. Third, you might need to pay an additional usage charge if your plan doesn't include unlimited access. Fourth, if you need to buy the necessary hardware for an ISDN arrangement, the cost to purchase an ISDN NT1 device is about $200 (although this varies widely).

Now, if you're thinking that at least you'll save money by only using one phone line, then you'll be sorry to hear

Transfer Rate For A 10-Megabyte File

Speed/Type	Transfer Time
9.6Kbps Analog Modem	2.3 hours
14.4Kbps Analog Modem	1.5 hours
28.8Kbps Analog Modem	46 minutes
56Kbps Analog Modem	24 minutes
128Kbps ISDN Modem	10 minutes
1.5Mbps to 9Mbps ADSL Line*	8 to 52 seconds
1.54Mbps T1 Connection	52 seconds
4Mbps Cable Modem	20 seconds
10Mbps Cable Modem	8 seconds

Chart statistics (except ADSL) are courtesy of digitalNATION (http://www.dn.net).
*The ADSL statistic (added by Smart Computing) are based upon varying connection types and service providers.

that you've struck out there, too. The theory behind ISDN is that users only need one phone line to use it, but this isn't entirely true. Because the ISDN service is implemented in such a way that makes it reliant on the NT1 device, if the NT1 loses power, so does your ISDN line. In other words, if your power goes out, then your phone service is unusable. That's why Pacific Bell, an ISDN service provider, recommends that its customers install ISDN on a separate phone line.

A final disadvantage is that ISDN service isn't available everywhere. It is offered by all the major telephone companies, but not in all parts of every state. In addition, customers may need to meet loop requirements; that is, they may need to be within a certain number of feet of the telephone company's central office. The best way to find out whether you qualify is to visit the Web site of your local telephone company and locate the pages devoted to ISDN. For instance, U S WEST customers can visit http://www.uswest.com/products/data/isdn/isdn_slavailability.html and input their area code and prefix to see whether they can order ISDN.

For more information on ISDN, be sure to visit the Web site of The North American ISDN Users' Forum (http://www.niuf.nist.gov/misc/niuf.html).

The Digital Word On DSL

DSL is another high-speed broadband service that many telephone companies (primarily) and other providers offer to consumers. Like ISDN, xDSL uses a special device (resembling an external modem) to transmit data via the standard copper telephone wires found in most homes throughout the United States. With xDSL, however, the information transmits so quickly that the connection appears to the user as a dedicated pipe to the Internet.

The speed of transmission depends upon the type of xDSL connection you have. For instance, Asymmetric Digital Subscriber Line (ADSL) sends data from the Internet to your computer at speeds ranging from 1.5 megabits per second (Mbps) all the way up to 9Mbps; however, data sent in the other direction ranges from speeds of 256Kbps to 640Kbps. Symmetric Digital Subscriber Line (SDSL) is another flavor of xDSL that supports the transmission of data at speeds of up to 3Mbps in both directions.
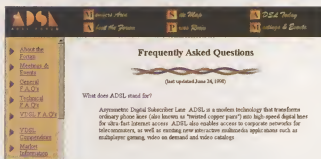
The ADSL Forum is a valuable resource that provides numerous answers to frequently asked questions, as well as other helpful information.

Both xDSL services can offer incredibly fast connections because of the way they squeeze the maximum capacity out of a telephone line. Using sophisticated digital coding or modulation schemes, xDSL packs data onto copper wires, letting you use the phone and surf the Web simultaneously.

ADSL, which is popular in the residential market within the United States, and SDSL, which is booming in Europe, are the most popular flavors of xDSL. Although there are other types of xDSL in use or under development, they primarily serve complex systems such as cellular antenna stations, private data networks, and PBX network connections (a private telephone network used at larger organizations). For most PC users, xDSL service is more meaningfully described as ADSL, the method most frequently used for high-speed Internet access from your home or small business. If your local phone company offers xDSL services, more than likely it's actually

ADSL, but is shortened and referred to simply as DSL.

If you are lucky enough to qualify for DSL service, here's what the setup will probably entail. It begins with a standard telephone line connection to an ADSL router (sometimes referred to as a DSL modem). Next, the setup requires users to connect the router to the computer via a typical external modem line and RJ11 jack or connector. And, like the ISDN setup, the computer needs a network interface card (NIC) in order to communicate with the router.

The ADSL router itself will vary depending upon your service provider and telephone line arrangement. Some routers have ports where you can directly plug in other communication devices, such as a telephone. Other routers require a splitter (a small device that is similar to a splitter for two telephone lines) so that one line can run from the splitter to a telephone and the other line can then connect to a phone jack.

Again, ADSL setup arrangements differ depending upon the types of services your provider offers. For instance, U S WEST's MegaBit Services offer both internal and external ADSL routers. In addition, several other DSL providers are now using a new setup arrangement known as G.Lite, which involves less configuration for users and service providers. The G.Lite standard makes ADSL easier to install because, among other things, it takes advantage of a digital technology known as Digital Loop Carrier (DLC). Of course, G.Lite may not be as quick as xDSL access methods, but it still boasts speeds of 512Kbps to 1.5Mbps.

ADSL has other advantages, such as the ability to maintain a connection that is always "on," without the need to repeatedly dial into an ISP's server, as well as the ability to network two or more PCs so that several can be online simultaneously. Moreover, users can accomplish both of these arrangements with only one telephone line.

The bad news about ADSL is a familiar story for broadband technology. ADSL isn't widely available because most telephone companies require users to be within a certain number of feet of a central office. In Boulder, Colo., for example, that distance is only 15,000 feet. So, even if you live in a city or town that offers DSL, your residence may not fall within the loop link requirement.

If you do qualify for ADSL service, be prepared to pay up to $300 for the installation and ADSL router. But check with your provider because some are now offering free installation and equipment to consumers who agree to use the service for a specified amount of time. In addition, expect to pay a monthly fee of $30 to $40 for the ADSL service. (The good news is there is no usage charge since the connection is always established.) If you add the ADSL service charge and another $20 to $40 for ISP charges, that calculates to about $50 to $80 per month.

For more information, we recommend that you visit The ADSL Forum (http://www.adsl .com/adsl_forum .html). This helpful resource answers frequently asked questions, displays ADSL offerings worldwide, and offers various analyst insights and opinions.

Traveling Online Via Cable

ISDN and DSL have become popular by taking advantage of copper telephone lines, a standard already found in most homes. Cable is another high-speed Internet access option that essentially does the same thing by taking advantage of another standard setup found in most homes: cable television.

A cable modem is a device that lets data flow between your PC and the Internet. Note that a cable modem works with your PC, not with your television. WebTV is something entirely

Home Installation Arrangements

These three illustrations demonstrate the basics for installing the ISDN, DSL, and cable modem Internet access methods in a typical home.
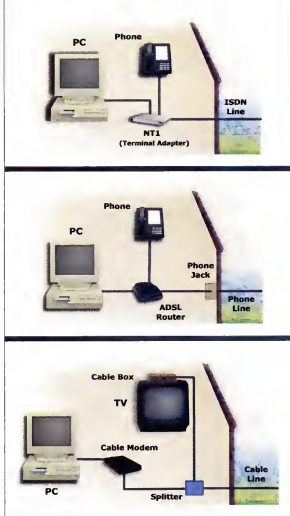
different. WebTV refers to the category of products that let you surf the Web from your television, and to do this, most of these products connect the telephone line to the TV. Cable modems, on the other hand, are strictly designed to work with a PC, and phone lines are generally not involved in the setup. Instead, some of the cable line bandwidth is digitized and used for data rather than television signals.

the standard configuration is quite simple. The cable modem connects to the cable jack (usually with the assistance of a splitter), and then the cable

modem connects to the PC via a network line and RJ45 connector. Plus, the computer must have a NIC or similar type of network card. Due to the assistance of a splitter, users can also utilize the same cable line for cable television service.

Although the industry does refer to a cable modem as a modem, the word "modem" itself is a bit imprecise. Cable modems do modulate and demodulate signals like analog modems, but cable modems can also include other features (depending on the device) such as an NIC or an encryption feature.

The speed of a cable modem connection is closer to DSL than to ISDN, although that number can vary widely. Cables were designed to pass large amounts of data downstream; that is, from the information provider to the consumer. In theory, transmissions can pass from the Internet to your computer at speeds of up to 27Mbps, but given the limitations of most computer systems, that number is more likely to be between 1Mbps to 3Mbps, which is right on par with DSL. In the other direction, speeds tend to be between 500Kbps to 2.5Mbps, making cable somewhat faster than DSL.

Another similarity between cable modems and DSL is that being online does not interrupt other household communications devices. Although the data is transmitted via a television cable, cable modem users can watch TV, go online, and use the telephone—all at the same time.

All is not equal with these two services, however. One important distinction is that DSL users each have their own copper wire setup. Cable users, on the other hand, share a cable network, so each time a new computer is added to the network, resources are further split among its users. For example, you might notice a drop in performance if your neighbor is online 24 hours a day,

seven days a week, downloading hefty graphics from the Web. For that reason, it is still unknown how the cable networks will handle traffic if millions of users begin signing up. This may also lead to the growth of telco-return cable modems, which transmit data from the Internet via cable lines but transmit data from users to the Internet via telephone lines.

Still, despite all the unanswered questions, cable modem access is becoming increasingly popular. One of the leaders in this field is @Home, a one-stop shop for Internet access via cable. The @Home service has partnered with a number of cable companies throughout the United States and Canada, including AT&T Broadband & Internet Services, Century Communications, Comcast Corp., Cox Communications Inc., and Jones Intercable. For more details, visit the @Home site (http://

www.home.com). From this Web page, you can find out whether the service is available in your ZIP code. Another alternative is to call your local cable company for availability information.

Finally, it's time to ask the big question: What will this cost? First of all, you can expect to pay $100 to $200 for the installation. Then, the cost for the cable modem service is typically between $40 to $60 per month, which often includes an Internet service package with unlimited access, specific software and content, and the option to lease a cable modem. Cable modems aren't usually sold at the retail level because providers all require different cable modems due to the type of network equipment they have. However, that situation may change within the next year or two. For more information, check out the Cable Modem Info Center (http://www.Cable datacomnews.com/cmic).

Entering The Broadband Horizon

So what will it be? Should you get ISDN, DSL, or cable? All offer high-speed Internet access, but each also have some important differences for making your decision. According to the most recent statistics, it's already clear that avid Web surfers are more than willing to invest in speedy Internet connections. What is still unclear is whether broadband Internet access methods can continue to co-exist somewhat peacefully or whether one will triumph with an overwhelming market share. If past experience in the computer industry is any indication of what intense competition can accomplish, consumers can look forward to falling prices and increased options online. **II**

by Heidi V. Anderson

Broadband Options Beyond The Big Three

I f you've seen the latest statistics, then you know that consumers obviously favor ISDN, xDSL, and cable modems over other Internet access methods. But if you're curious about what other broadband options are available and why they aren't in the consumer spotlight, we've provided some basic information below.

T1 lines. This Internet access method consists of dedicated lines that transmit data at 1.544 megabits per second (Mbps). One of the primary reasons businesses tout T1 lines is because they contain 24 channels in one single communications line. That's a lot of power, certainly enough power to support large computer networks. For the average consumer, however, T1 lines are far too

expensive and offer few speed-related benefits when considering the monthly leasing charge of hundreds to thousands of dollars. Some providers do offer fractional T1 access (where a consumer can lease a portion of a T1 line), but again, the cost is still usually more than average consumers want to pay for Internet access.

Modem bonding. You may hear some users describe this Internet access method as "dual analog" or "piggybacking" modems. Modem bonding is a way of hooking together two standard modems, such as two 56 kilobits per second (Kbps) modems, in such a way that they work together to double the speed that just one analog modem can provide. Although this does

accomplish faster transmission speeds, there are some major drawbacks. First of all, not every Internet service provider (ISP) offers dual analog service. Plus, even if a particular ISP offers the service, it may not be offered to all customers due to location variables. The equipment itself isn't all that complicated, but dual analog setups do require more effort than consumers might expect. In addition, because you may have to pay for two ISP accounts, modem bonding doesn't seem to provide that much of a benefit.

Satellite access. This technology is a method by which Internet content is downloaded to a satellite dish and then transmitted directly from the dish to

your PC. One of the leaders in this industry is Hughes Satellite Systems with its DirecPC service. Using DirecPC, users dial up an ISP via a standard modem connection and request to view a Web page from a Web server. But instead of the page being sent back over the user's modem connection, the request goes to the Hughes network operations center. From there, Hughes beams the request to a DirecPC satellite, which sends the Web page to your satellite dish at speeds of up to 400Kbps. Along with the $400 to $500 installation and equipment charges, consumers can expect to pay a monthly usage charge of between $30 to $80 for home use. **II**

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Installing More Broadband Power

Setup Reviews For Cable, DSL & ISDN

GETTING ONLINE with a high-speed broadband service provider isn't as simple as plugging your modem into a phone outlet and connecting to America Online. It takes a bit more work on both your part and the part of your provider. And yes, it will cost you more, but once you have the installation out of the way, your online life will forever be transformed. You will become one of the digital supreme—a member of the online elite. But before the multimedia glory can flash before your eyes, you must endure the boredom of the setup process.

Nevertheless, the setup process is extremely important to consumers who are comparing broadband services, so we asked three writers to discuss their installation experiences and what it takes to install high-speed Internet access at home. This article includes a setup review for each of the most popular broadband services available today: cable modem, Digital Subscriber Line (DSL), and the Integrated Services Digital Network (ISDN). For more information about how each of these methods operate, see "Broaden Your Horizons Online" in this issue.

Cable Modem

Our provider's regular cable modem connectivity costs are:
- One-time installation fee: $150
- NIC purchase (if your PC doesn't have one): included with installation fee
- Cable modem ongoing service charge: $40/month
- Cable modem rental: included with monthly service charge

Ask anyone who has ever waited around for a television cable installation and they'll tell you that waiting at home during a four-hour window is a serious pain. Use the time wisely by balancing your checkbook. Our installation was "on sale" for $100, which included a network interface card (NIC) for our PC and a $50 savings from the regular price of $150. In addition, our access service charge and cable modem rental charge cost $40 per month. And although our installation took place in the San Francisco Bay area, the process and prices are exemplary of cable setups nationwide.

The install representative from our provider, TCI Cable (partnered with the @Home Network; 888/262-6300, http://www.home.net), was prompt; he arrived only an hour into the four-hour window. Loaded with more electronic gadgets and gizmos than we have ever seen on one person, he analyzed our cable line (both inside and out), ensuring that it was clear enough for digital bandwidth. He needed to make a few adjustments to the line, but his device finally declared the cable sound for Internet purposes.

Hard & Soft Install

After the line was clear, he began the PC configuration. Cable modems are not like normal modems—they don't just plug into your PC. You will need an NIC (usually provided as part of the installation package or available for an extra fee) for the external cable modem to interface through (in order to communicate with your PC). An NIC install is no simple process, but this one went smoothly.

Next, the install representative adjusted all the software settings via the Network Neighborhood icon on our Desktop. This little icon is home to all the software functions for your PC's networks, including our high-speed connection to the 'Net. We watched closely and wrote down all the entries so we could repeat the process in the event of a system crash.

Because our cable company is an ally of the @Home Network, we also received @Home's software. Its attractive interface provides a portal to the Internet, filled with multimedia sounds and images. Of course, if you want to, you can also use whatever Web browser and E-mail program you desire for your online activities.

Protect Your Speed Machine

The entire installation took less than two hours. After the representative packed up his tools and left, we experimented with the blazing speed that we'd only imagined was possible.

Thankfully, this real-life version didn't disappoint us. Web pages instantly popped into view. Downloaded files appeared on our PC within seconds. And streaming audio and video appeared clearly (as clear as it gets online, anyway) and no longer stopped to buffer every few seconds.

But as a wise man once noted, with great power comes great responsibility. A full-time connection to the Internet means no longer waiting for the modem to dial and connect before browsing. At the same time, it also creates an open door for hackers and viruses. Not to worry, we took a few simple steps and made some modest investments to keep our PC safe.

We opted for the ConSeal personal firewall software from Signal 9 Solutions Inc. (613/599-9010, http://www.signal9.com). It's only $50 and can be automatically set up for users with cable access. @Home supposedly has their own firewall that would-be miscreants have to penetrate, but judging from the number of attempts—between one to five a day—to infiltrate our system, we'd say ConSeal is a good investment. Most of these efforts are

The @Home service provides Internet software for its users and has partnered with a number of cable companies in the United States and Canada to offer Internet access.

harmless FTP or Telnet attempts, which are standard Internet transmissions, but there are some scary lurkers out there, so it's better to be safe than sorry.

If you don't have a good antivirus program, get one. We recommend Central Command's AntiViral Toolkit Pro (888/236-2446, 330/723-2062;

http://www.avp.com). This $25 program is what many hackers themselves use. For us, that was recommendation enough.

At first glance, it might seem like getting cable modem access is quite an investment, but once you've used it, you'll realize that higher bandwidth is worth its transfer rate in gold. Check with your cable provider to see if cable modem access is available in your area.

DSL

Our provider's regular ADSL connectivity costs are:
- One-time installation fee: $100
- Optional on-site setup fee (only if necessary): $59.95
- NIC purchase (if your PC doesn't have one): $29.95
- ADSL ongoing service charge: $39.75/month
- ADSL Router lease-to-own charge: $29.75/month
- ISP ongoing service charge (via another provider): $19.95/month

The benefits of DSL, including the online connection speeds ranging from 256Kbps to 9 megabits per second (Mbps), will make online aficionados jump for joy. But to obtain this speed, there are a few obstacles to overcome: availability, cost, and the install process. These obstacles vary from location to location, so you'll need to call your local phone company and Internet service providers (ISP) for details. You may also want to check The List (http://thelist.internet.com) for DSL availability. The DSL provider we're using is Aliant Communications (888/870-4567, 402/436-4321; http://www.aliant.com)

Attain Greater Bandwidth

Our friends in a nearby city have been luxuriating with their high-speed connections for more than a year.

When our local telecommunications company decided to get on the DSL bandwagon, we were ecstatic. Our connection, like most DSL setups in U.S. homes, is technically known as Asymmetric Digital Subscriber Line (ADSL). ADSL transmits data from the Internet to your PC at speeds ranging from 1.5Mbps to 9Mbps. Data transmitting from your PC to the 'Net, however, only reaches speeds of 256Kbps to 640Kbps. These numbers, of course, depend on diversified phone company standards and may vary slightly.

Because DSL is very distance sensitive, the first thing the phone company did was check our range from their nearest switch. The switch runs a fiber optic line to the central office and standard copper phone wires to local areas. Acceptable DSL distances are measured by the length of copper wire from the phone company's switch to individual user locations. For instance, our local phone company insisted on a range of no more than 15,000 feet, or approximately 3 miles, from the nearest switch.

Pricing The Good Life

Once they approved our distance from the closest switch, we started looking at service costs. After investigating our two local providers, we went with the least expensive personal user plan, which was still substantially faster than our old 56Kbps connection. We selected ADSL data download and upload speeds of 384Kbps and 272Kbps, respectively.

The monthly charges for our old Internet access arrangement were $49.95; $19.95 for the ISP service and about $20 for the second phone line. When we got ADSL, our provider waived the one-time install fee and monthly router lease-to-own charge because we signed a 12-month service contract. Plus, we eliminated another $20 monthly bill by canceling our second phone line. Therefore, our current monthly bill is now $59.70; $39.75 for the ADSL service charge and $19.95 for the ISP charge. As a result, we're not paying that much more each month,

yet we now have a permanent connection online that is more than six times faster than our old 56Kbps modem.

Installation Simplicity

ADSL was relatively simple to install and took us less than 20 minutes, excluding the drive to our phone company to sign the contract, fill out the paperwork, and pick up our ADSL router and instructions. Upon arriving home, we plugged the router into our standard RJ-11 telephone jack in the wall and plugged the network connector (a RJ-45 jack) into our PC (via the pre-installed 10Base-T NIC). We followed some of the basic ADSL instructions and modified some network settings within Windows 98 for Internet connectivity. After rebooting once, we found ourselves happily surfing the Web. And because our connection is active 24 hours a day, we don't have to sit through the Internet logon process several times a day.

The overall installation experience will be easy for most PC-literate users, however, if you don't have an NIC in your PC and don't feel adept at opening your PC's case, paying the optional install fee to have a technician set up everything for you in your home is worth the extra money. It is also good to note that install fees and monthly charges can vary between providers, so be sure to get prices from all available sources. If you plan to keep your connection for more than a year, ask if a contract is available. This could save you a significant amount of money.

It may be tempting to buy your own DSL equipment as products continue to filter into the marketplace. But we recommend that you stick with the equipment provided by your service provider for maximum compatibility.

ADSL routers, such as this one from Cisco Systems, provide PCs with the digital help they need to venture online.

Network terminating devices (NTIs), such as this one from 3Com and U.S. Robotics, are also known as terminal adapters or ISDN modems.

IDSN

Our provider's regular ISDN connectivity costs are:
- One-time installation fee: $125
- NIC purchase (if your PC doesn't have one): $30
- ISDN ongoing service charge: $26/month (plus extra usage fees)
- Terminal adapter purchase: $200
- Second telephone line ongoing service charge (optional): about $20/month
- ISP ongoing service charge (via another provider): $29.95/month (plus a one-time setup fee)

ISDN lines offer Internet connections that are fast enough to download large graphic files, as well as provide a dedicated phone line and communications line for your fax machine. ISDN users can utilize any two of these three options simultaneously. That pitch was convincing enough that we embarked on a real-world test that, so far, has continued for more than two years. For the most part, our ISDN system has been reliable. On the downside, power outages can affect the terminal adapter and render our telephone line as unusable. Our advice? Keep an analog phone line, too, especially if you're in areas subject to numerous power outages.

Costs vary by state and by company. At Southwestern Bell (800/ 331-0500, 817/922-0994; http://www.swbell.com), the install fee in California is $125 if you use existing lines. The basic monthly rate is $26, plus usage fees, which calculates to about $10 more than you'd pay for an analog line. The terminal adapter itself costs about $200, and if your PC doesn't already have an NIC, you'll need to purchase that, as well. Plus, you must sign up with an ISP that can handle ISDN lines.

Setup Basics

First, contact your local phone company to see if ISDN is available in your area. ISDN is only offered in major metropolitan areas and many national carriers include ISDN information on their Web sites. For the actual install, there are two parts: setting up the line and setting up the terminal adapter. We were the first in our area to install ISDN, so our provider had to install several ISDN relays. ISDN providers also check to see if you need a different phone jack or new wiring. To make sure our line was compatible for ISDN, the technician checked our phone box (outside our home) and tested the phone jack outlet inside our house.

Next, install the terminal adapter, which technically is known as a network terminating device (NTI). Before we could install the NTI, we had to configure our PC via the Dial-Up Networking feature in Windows. Make sure that you write down all network protocols and settings. Some ISDN NTIs still require service profile identifiers (SPIDs), so contact your phone company to find out what SPID numbers are assigned to your line and write down these numbers, too. More modernized NTIs automatically configure themselves and can be installed within 15 minutes. All you need are the phone numbers for the ISDN line's two "B" channels. NTIs now also have jacks that connect directly to phones and fax machines so make sure your NTI has the features you want before you buy one.

Most importantly, make sure you shop around for ISDN providers to find out who is offering the best deal and the fastest transmission rates. Although many phone companies offer ISDN and Internet access, you'll need to ask very direct questions. For example, ask for a complete list of what fees are involved and what transfer rates you can expect. Although ISDN is capable of transfer rates at 128Kbps, some providers only offer 64Kbps services. ∎

by Joel Strauch, Samit Gupta Choudhuri, and Gail Dutton

The Customer Service Barrier: Perception Or Reality?

Horror Stories Are Common, But Statistics Show Most Customers Are Happy With PC Service

IMAGINE FOR A MOMENT that you have just purchased a brand new PC. You arrive home from your local electronics superstore, open the two or three large boxes, and begin the process of wading through copious amounts of Styrofoam packing material, manuals, and registration cards. Finally, you find the sealed plastic bags containing your PC, monitor, printer, and cords. Some time later, when you have everything set up, you sit before your new shrine to high technology, your eyes roving slowly across its clean, efficient exterior, and the moment of truth arrives. The power button emits a satisfying click as it settles into the On position, and then...nothing.

When the exhaustion hits hours later, your primary goal in life is to torture the maker of this computer with your bare hands. You have checked and rechecked every connection, switch setting, and circuit-breaker. What is worse is that you have spent hours on the phone with Steve in the technical support call center for the company that built your wretched heap of silicon and plastic. Steve has proven incapable of solving your problem. Plus, he has demonstrated such an utter lack of knowledge and manners that you are toying with the idea of making his demise second on your to-do list.

Unfortunately, true stories such as this aren't hard to find. Consumer advocacy groups and editorial watchdog columns receive daily complaints about bad service and technical support. This is why we set out to research the current state of customer service. We expected to find proof of an industry with a chronic problem of not taking care of its customers after the sale. We found, however, that the research and industry experts painted a different picture.

Consumer Statistics

We spent a considerable amount of time talking to market analysts and scouring the Web for some dirt on hardware and software companies in the form of consumer satisfaction surveys, Better Business Bureau reports, and other hard numbers. We didn't find any. What we did find was a considerable amount of evidence in the form of complaint letters to editors of computer-related and personal Web sites decrying the hit-and-run sales tactics of major computer corporations. These sites described tales of being left at the proverbial altar with a piece of hardware or software that didn't work right.

This notwithstanding, the lack of statistical information surprised us. In fact, the studies we found indicated that most computing consumers are happy with the service they receive. A nationwide Harris Poll in April 1999, found 80% of consumers thought computer hardware companies do a good job of serving their customers. Likewise, 80% thought software companies offer good service. These numbers were nine percentage points higher than the next closest type of companies (commercial airline) that respondents claimed they were happy with. To put these results in perspective, only 70% of the respondents to the same survey thought car manufacturers generally do a good job of serving their customers.

One of the most vilified computer companies among those mentioned at personal Web sites is Gateway. It even popped up in a 1997 Federal Trade Commission (FTC) report. The FTC fined Gateway nearly $300,000 for violating FTC rules and acts pertaining to warranties in making certain misleading claims of "money-back guarantees," and "on-site service." Despite this seemingly damning evidence, a 1997 International Data Corp. (IDC) and AC Nielsen survey tells a different story. To determine brand loyalty, they polled PC owners who had recently bought a second PC. Gateway came in at the top of the list with nearly 77% of Gateway owners having recently purchased another Gateway PC.

Industry Attitudes & Numbers

If the state of customer service in the computer industry is really as bad as it seems, it's news to computer companies. On its Web site, the aforementioned Gateway proclaims, "Price and performance help bring customers in the door, but service and support brings them, and their friends, back again and again."

Charlie Gulotta, manager of analyst relations for IBM's Personal Systems

Illustration: Jim Mehsling

Group, has no qualms about extolling Big Blue's service and support, and he suggests that IBM goes beyond simply fixing things when they break. "Historically, companies have looked at service and support as a break-and-fix kind of thing, but really it's the perfect time to talk to customers about their needs and what they might need to enhance their experience," Gulotta says.

While there may be those who view such statements from computer-related companies as mere window dressing, the statistics back up the claims. IDC recently announced that revenues in the worldwide software support market increased 14% in 1998 to reach nearly $22 billion. The release also stated that the majority of spending by companies in this market goes for telephone support services. In a separate report, IDC projected that worldwide technical support call center revenues would be $58.6 billion by 2003. With numbers like these, companies certainly don't seem to be skimping on customer service.

Where's The Beef?

The apparent situation is that while hordes of angry customers feel abandoned by their hardware and software companies, many of those same companies are spending tons of money hiring people to oversee and manage their customer service centers (and to develop new support programs). Adding to the confusion are the results of multiple consumer satisfaction surveys that indicate customers of hardware and software companies are happy with their service.

There are two possibilities as to why the discrepancies exist. One is that the research is missing the mark and overestimating the general public's satisfaction with customer service. This could be a result of skewed statistical research or maybe it shows the Tip-of-the-Iceberg theory advanced by sociologist Drew Hyman in 1987. Hyman's theory states that consumer complaints to third-party intervenors (market research firms, public and private consumer protection agencies, regulatory

commissions, and government officials) "...are but a portion of those that exist in the broader population." (For more information on the Tip-of-the-Iceberg theory, go to http://www.aers.psu.edu/csis/PUBS/IcebergFull.htm). If this is the case, the computer industry has bigger problems than it realizes.

The other possibility is that the research is correct, and most customers are getting the support they need. This would mean the seemingly large number of complaints is due to the tendency of unhappy customers to be much more vocal than happy customers. The ease of publishing such opinions on the Internet makes it simple for a vocal minority to plead their case to a worldwide audience. While this idea doesn't invalidate the complaints of consumers who receive unsatisfactory customer service, it may explain the common conception that there is a real customer service problem within the hardware and software industries despite the evidence that the majority of consumers remain satisfied.

The Truth Is Out There

We are not trying to say that customer support problems don't exist. As we mentioned earlier, we hear complaints of poor service almost on a daily basis. But considering that by the end of 1998 there were more than 364 million PCs in use around the world (Computer Industry Almanac Inc.), the true magnitude of the customer service and support problem is probably not so bad as one might believe.

We realize, however, that such assurances are little consolation to those who are unable to get satisfactory help from the company that made their PC, peripheral, or software. If you are in such a bind, check out the November issue of *Smart Computing*. We will provide advice for dealing with rebate rip-offs, unresponsive technical support, and refusals to fix your faulty products. ∎

by Chris Trumble

Serving Consumers

In an April 1999 Harris Poll, 1,006 adults (surveyed nationwide) were asked whether they generally thought a specific industry, such as airlines and hospitals, did a good or bad job of serving their customers. Surprisingly, the computer industry came out on top of the heap.

	A Good Job		
Company Type	1999 %	1998 %	1997 %
Computer hardware companies	80	77	n/a*
Computer software companies	80	78	80
Airlines	71	78	n/a*
Hospitals	71	73	77
Car Manufacturers	70	69	70
Banks	68	72	75
Telephone Companies	67	76	80
Pharmaceutical and drug companies	66	73	79
Life insurance companies	61	63	64
Oil companies	55	64	59
Health insurance companies	41	48	55
Managed care companies	34	45	51
Tobacco companies	31	32	34

(*n/a=not asked)

More Than Just An Index

About.com
Offers A Personal Approach
To Web Surfing

About.com lets you explore expertly gathered information from 18 categories.

In a World Wide Web filled with search robots and shoddy index synopses, it's easy to feel everything is run by scripts and that humans have been dispensed with like dead hyperlinks. Fortunately, About.com is one Web index where everything is about the human touch, about quality of content, and about making sure you get the answers you want.

Previously named The Mining Company, About.com (http://www.about.com) doesn't care about trying to catalog every little corner of the Web. Instead, prominent topics and geographic locations are assigned to a "Guide." The guide builds a Web site around each topic, writing original articles, assembling a list of outside Web links, and personally fielding questions from visitors.

About.com has one flaw: There is simply too much great stuff to investigate. We tried to focus our analysis on only a few About.com sites, but the temptation to veer off into associated links and articles was more than any curious mind could withstand. Indexes such as Yahoo! are painless to weave in and out of. You run your search, bounce across three or four unwanted sites, and finally disappear into a site that matches your needs. With About.com, you're already at the desired site so outside links are usually supplements, not the final objective.

The quality of material About.com guides provide is generally top-notch. For instance, in the screenwriting section we found a brilliant, entertaining, two-part plot analysis of "The Matrix" that could shame the efforts of many English professors. Guides are experts in their respective fields and take pride in the sites they maintain and the interaction they carry on with visitors.

No other index or portal provides such detailed service, and the differ-

TIPS ... For Using About.com

Cut To The Chase. In an effort to rescue topic sites from a maze of lengthy subdirectories, About.com lets you save time by integrating the topic into the Web address. Want to go straight to the site about Philadelphia? Try typing in http://www.philadelphia.about.com. With 650 topics, the odds are pretty good you can bypass the search engine altogether.

A Better View. When you're in the About.com forums,

save yourself a lot of extra clicking and waiting by switching to Advanced View. The link is located right below each message posting. Advanced View displays all messages in a discussion thread one after the other, creating a single long page. Additionally, Advanced View allows you to change the postings' font size.

Stay Off Mailing Lists. If you choose to become an About.com member, make sure to read the three

Newsletter & Information options at the very bottom of the registration page, all of which default as being selected. Two of these options are for receiving About.com newsletters, but the middle option basically grants permission for About.com to sell your name to commercial partners. If you dislike spam, consider deselecting any or all of these.

Learn The Ropes. New users joining in forums who are unacquainted with the ways

of newsgroups should check out the links at the bottom of the Forums login page, particularly the FAQ and Guidelines.

Do A Little Eavesdropping. If you're curious but still unsure about forums, each forum login page offers the option to join as a guest. As a guest, you can lurk about and get your feet wet without actually feeling obligated to participate. ▮

ence is immediately obvious. You don't get a few of the standard portal offerings, such as a free E-mail account, but most services are still here.

About's Anatomy

The About.com home page offers more information than first glance might suggest. About.com's 18 main subject channels dominate the page; this is standard index fare, and there are no navigation surprises. However, clicking one of these channels yields some interesting results.

Index users are accustomed to getting page after subpage of ever-narrowing subjects until they finally reach individual universal resource locators (URL; a Web address). About.com does things differently. When we clicked the first channel, Arts/Literature, the focus of the next page was not narrower subject listings, but rather it was a trio of guide/article spotlights, each with a photo of the author. Actual subcategories are in fine print off to the side. We'll return to channel pages in a bit, but it's important to understand About.com emphasizes the talents of its guides over traditional index formatting.

Back at the home page, a single search field is located above the channel listings. It's tempting to try and navigate the long way to your desired topic because it's so much fun getting there. However, using the search engine is a tremendous time-saver.

First, About.com returns any sites that match your query. This makes sense because it's often more useful to find a topic site than an individual reference to your term within a page. Still, the second returns section is exactly that, actual page hits just like you would get if you were using an index search.

To the right of the search field is the Join Free link. Essentially, membership grants you space at About.com to post a preformatted biographical page.

On your page, About.com encourages you to include links to any other pages you may have elsewhere. Membership is free and only requires filling out a standard registration form that includes your name, password, E-mail address, etc. Once you register for membership, your information automatically will be used if you elect to join any site communities.

To the left of the search field is About.com's sweepstakes section. These promotions are tied in with corporate sponsorship, so be aware your entry may be putting you on solicitation lists.

Below the sweepstakes is Guides In The Spotlight, which is essentially a

Guides like Chris Sherman gather all information, links, and tips about a topic, such as Web searching, so you don't have to.

handful of articles selected from different sites. The title is a bit misleading because the section offers articles, not Guide bios. The same holds true for Guide Of The Day, which whisks you to that guide's topic site.

Under the Channels area in the lower center of the page is Talk About. This section highlights the forum and chat aspects of About.com. Clicking Hot Forum Topics will take you to a login screen and links to the assorted channels and their more than 500 forums. Below this link is a teaser quotation, some excerpt from a recent posting meant to entice you into the conversation. Whether you agree or disagree with the assertion, the

provocative statement is clearly chosen to draw you into the discussion.

Below Hot Forum Topics is Chat-About It Today!, a listing of upcoming chat room discussions. This is followed by Chatting Now, a head count of participants in active chat rooms, and ChatCentral, the master list of available About.com chat topics and schedules.

At the bottom of the center column is All About, a sort of leftover bin for four items that didn't belong anywhere else. Newsletter is your gateway to the E-mail newsletters published by About.com and its subordinate sites. The remaining three links, Books, Videostore, and ShopCenter, all are devoted to cooperative commercial offerings or, in the case of ShopCenter, banner ads.

Close to the top of the home page's right column is the Daily section, which is a short collection of national and world news headlines. This is followed by the self-explanatory Stock Quote section. Proceeding down, About Today is About.com's compilation of links to what its guides are writing about contemporary news. Joke Of The Day is just for grins.

The last section, Surprise Me! is in the lower right corner. Click it and be transported to a random About.com site. Below this are three links that continually change, each of which links to a special About.com feature.

Your Tour Guide

So that's the home page. Let's take a look at how a topic site is strung together. Our example is guide Chris Sherman's pride and joy, Web Search.

At the top of the site's welcome screen is a photo of Sherman alongside the topic name. Right underneath this is an About.com staple, You Are Here, which shows exactly which subcategories you passed through to reach this

ABOUT.COM   Fact Sheet

Originally founded as The Mining Company, the May 1999 name change to About.com was meant to demonstrate a focus shift from being simply a data mining company (or information portal) to being a human-centric service. It also may have something to do with the many people who avoided the site thinking it belonged to a metals mining firm.

According to Media Metrix, About.com is now the third-largest news, information, and entertainment site and the 23rd largest Web property overall.

Undoubtedly, this success is due to the efforts of its professionally qualified and talented guides, each of whom undergoes an intensive screening process.

Guide Chris Sherman stresses that unlike employees of traditional portals, About.com guides are personally accountable for the accuracy of their information. He also points out that About.com is different than a similar site, Netscape's Open Directory Project. With that service, you can communicate with those coordinating Open Directory's information, but there are no biographical pages to help you get to know them and no efforts made toward building a community.

While About.com currently showcases approximately 650 topic sites, the company has a list of topics still open for prospective guides (at http://beaguide.about .com). The majority are for cities, but several intriguing subjects are still up for grabs, including Hinduism, Investment For Beginners, Plastic Surgery, and Professional Wrestling. The company estimates one in four applicants actually becomes a guide. ▮▮

page. You Are Here is a very handy tool for exploring a general topic so make sure to keep an eye on it.

Immediately below the header is another constant page element, the links for Content, TalkAbout, and ShopAbout. Content provides a quick shortcut to the main sections of the site located on the welcome page (NetLinks, Articles, Search, etc.). The one exception is the link for Guide Bio. If you want to learn about the site guide's identity and background, this is the only link that will take you there.

TalkAbout offers links to the site's community elements, such as the forum, chat area, and newsletter subscription. ShopAbout offers the same commercial links found on About .com's home page, except for the addition of a Yellow Pages link, which is more service than shopping.

The rest of the page is largely divided into three columns. The left column is dominated by Sherman's accumulation of NetLinks. In this example, 30 subjects are offered, such as Celebrity Search, Maps & Directions, and Reference, but the More Links option leads to even more information. We

followed the link for MP3 Search and were rewarded with a page filled with more than 20 links to MP3 sites across the Web, each with a description.

Under NetLinks is the Community section, which offers access to the site's frequently asked questions, newsletter, forum, and chat elements.

The center column leads off with In The Spotlight, a compilation of Sherman's most recent articles about Web searching. One example is Webcams Around The World, which not only provides an introduction to the subject but also 15 links to some of the world's most interesting camera views and five more links to the best webcam directories on the Internet.

Below In The Spotlight is Shopping, yet another chance to dig into About.com's commercial ventures. And if that's not enough, nearly all of the right column is devoted to commercial links, focusing around About.com's ShopCenter. This column pervades nearly every page within About.com except for the home page.

At the bottom of the right column is the InfoCenter, which contains links to

information about buying computers; breaking financial news and stock quotes; free online cards and newsletters; and About.com's Bookstore, Videostore, and Today sections.

Near the bottom of the welcome page are three self-explanatory sections: Related About.com GuideSites, Elsewhere On About.com, and Search. Related About.com GuideSites offers the same links you would find moving up one step within the channel hierarchy. Elsewhere On About.com offers three of Today's Top Stories, as well as JustAbout, which takes you to three specific articles that appear on About.com. The Search bar lets you query from within that particular site or all of About.com.

All About Safety

As you explore About.com, be aware the company has a strong privacy policy and is endorsed by the TRUSTe organization. Any personal data you supply will remain within About.com unless you authorize the company to share it. This authorization happens when you register. For example, if you don't deselect the box for being on third-party company's promotion lists, you'll be queried for various commercial services. As long as you keep those boxes unchecked, your information should be used responsibly by About.com.

This concern for the experience of About.com users is representative of the site's entire mission of putting the human touch on to the Web. According to Sherman, carrying out this mission has involved a lot of changes and growing pains. "To be a successful Internet company, you have to operate on Internet time. Things get compressed, and you just have to go for it. But the results here have been worth it, definitely. It's one of those things where you'd almost be willing to pay someone to do it rather than having them pay you. Fortunately, it's the opposite." ▮▮

by William VanWinkle

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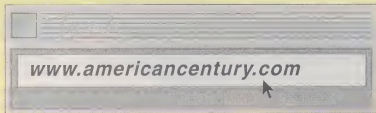
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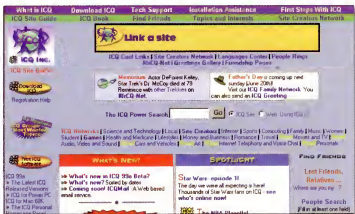
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Don't Hide Online: Go Seek

ICQ Helps You Find & Chat With Millions Of Users Worldwide

Having so much to say and so little space to say it makes ICQ one of the most cluttered sites on the World Wide Web.

Millions of people use the Internet, but you wouldn't know it from the lonely side of a Web browser. But don't despair, because you have ICQ, a real-time chat program that lets users know when others are online and then helps them strike up text-based conversations. With this Web site and its software, you can turn the solitary experience of Web surfing into one big party.

Unfortunately, the company that produced one of the most popular ways to communicate online has its own troubles getting its message out on the Web. If there is one Web site that needs a tour guide, ICQ (http://www.icq.com) is it. This site, which won last year's Mud Brick Award for the ugliest site online, overloads its home page with a ridiculous amount of information, making navigation frustrating to many. On the plus side, ICQ's site designers thought of nearly every piece of information users could possibly want, making ICQ a comprehensive, if incomprehensible, Web site.

It's no simple task to break down this mish-mash of information into bite-sized quantities. In the time we monitored the site, there weren't a lot of design changes, so instead of giving you geographical directions, we'll encourage you to look for certain descriptive landmarks instead.

Sound It Out

Say the letters out loud: I-C-Q; I Seek You, get it? ICQ lets you find your friends, family, and all the people you want to communicate with online in real time. The software will log in to ICQ's computer either automatically or on command whenever you're online to let your buddies know you have your ears on. You can create a list

TIPS ... For Using ICQ

Use The Links. The first time you visit the site you'll be hit with sensory overload. Avoid meltdown by using the links at the top of the page to direct you to the download area. After that, take a gander at the Frequently Asked Questions (http://www.icq.com/faq/index.html) and the ICQ Site Guide (http://www.icq.com/products/webguide.html). These two areas may help alleviate some of the initial shock.

Look Outside The Box. When you come back the second time, avoid the two columns that dominate the main page. Instead, concentrate on the icons outside the box. Some of the newest and/or most interesting features are showcased this way. If what you want isn't there, one of the icons will likely lead you to it.

Keep Your Options Open. To participate in any chat or network, you'll need to supply your ICQ number and password. The process varies, so follow the prompts as they appear and be sure to fill in all the required information. Remember, optional entry fields are just that—optional.

Tweak The Software. The ICQ site constantly offers new tools that enhance your use of the product. Periodically check out the first list of items on the left side of the page under the Free ICQ Software icon (http://www.icq.com/download/software.html) for what's new and cool in the ICQ enhancement line.

Secure Your Identity. Just because you want to have an online presence doesn't mean you want to let it all hang out worldwide. ICQ recognizes this concern and appropriately offers security options. Peruse the features at http://www.icq.com/features/security/security-tutorial.html and see what will work best for you. ∎

of your own to track pals and strike up a chat when they're on the Internet.

All users receive a Universal Internet Number (UIN), which is the access code to the world of ICQ. When you register, you can enter personal information that helps other ICQ users identify you. When you're finished registering, you can create your Contact List.

The people on your Contact List also must download ICQ for the chatting to work, but once they do you can chat, send favorite Web site links, play games, and more, all in real time. During conversation lulls, you can still be surfing the Web. ICQ is the best of all worlds: you have instant communication and the Internet at your fingertips.

While you're online, ICQ discretely announces your presence to your ICQ community and quietly ferrets out your contacts. When they log in, the program notifies you who's online, giving you instant access to chat, instant message services, and so on. Clicking an ICQ icon gets the real-time conversation ball rolling.

The Download

Obviously, one of the most important reasons to visit the ICQ site is to download the ICQ software. Fortunately for its users, downloading the ICQ software isn't nearly as difficult as getting around the Web site. The row of links across the top of the page includes a direct link to the site's download area, which makes it one of the few places that is easy to get to in the site's jumbled pile of links.

In case you missed the Download ICQ link at the top of the home page, there are other download links sprinkled around other corners of the screen. Some of these links lead directly to a download information page while others, such as the Free ICQ Software button, lead to another page that offers a link to the ICQ program download and links to ICQ-related software.

Under the Free ICQ Software button in the narrow column on the left side of the page are links to ICQ software downloads for different platforms. For starters, just click the Download ICQ link at the top of the home page.

Clicking the link takes users to a download page that describes the latest version of ICQ's standard chat

You'll find thousands of members chatting about hot topics in ICQ's Most Wanted Topics groups.

software. When we visited the site, ICQ was offering the "ICQ 99a Beta v.2.21 Build #1800." We don't always recommend beta versions (software that is in its final stage of development; beta versions usually are freely distributed so users can identify any bugs or problems that need to be fixed before the final version is released) of software for less-experienced users, but we couldn't find a nonbeta version on the ICQ site. This constantly evolving tool appears to be in a continuous beta form, but we had no problem using it. By the time you read this, a more final version may be available.

ICQ offers a couple of downloading choices. You can click one of the links at the top to download the program without further instructions, or you can scroll down and choose your platform. Scroll to the bottom of the page and click the ICQ version that corresponds to your operating system.

Another text-filled page appears with additional instructions. Click the Download link under the instructions

for Step 1. A new browser window opens to the Download.com site. Next, click the large Download Now link. If you are using Microsoft Internet Explorer, a dialog box will appear that asks whether you want to save the file to disk or open it. Choose Save This Program To Disk and save the file to your Desktop, the default choice. Click OK and wait for the download, then click-or double-click the file to start the setup process.

During setup, the program will prompt you to complete the registration process. Don't worry, registration is a cakewalk. Simply follow the prompts and fill in the required information. The optional fields let you determine how well others in the ICQ network get to know you.

When you get ICQ up and running, revisit the Web site to learn about all the things you can do with the software. The best course of action is to just dive in and see where some of the links go. The very top of the page features links to the most essential pages regarding downloading, technical assistance, and finding people online.

Chatting Around

If you want the most topical ICQ chats available, just look for the two boxes stuck willy-nilly at the top of the page. These twins typically are found just under the ICQ Cool Links banner and are updated fairly regularly to reflect the whimsy or news of the day. Around Veterans Day, for instance, you may find discussion groups for veterans; after a particularly bleak day for the Dow Jones, you may find commiserating daytraders or other interested parties.

Further information overload comes from the What's New and Spotlight sections. These areas form the two center columns of text on the Web site, but that's nearly the limit of their organization. What's New seems geared toward new ICQ technology and gizmos, and

ICQ.COM Fact Sheet

Just three years ago, Israelis Yair Goldfinger, Arik Vardi, Sefi Vigiser, and Amnon Amir created the first version of ICQ, called Mirabilis, as a way to "interconnect" the millions of people connected to the Internet. A few months later, the first version of the real-time chat program debuted online. By June 1997, ICQ became the first Internet company to have more than 100,000 concurrent subscribers. Although America Online acquired ICQ in 1998, the company is still based in Tel Aviv and now boasts millions of users worldwide.

The clamor for real-time connectivity generates newer versions, more advanced plug-ins, and more users all the time. ICQ tries to address the distribution of new tools and meet the needs of its millions of users by having an all-encompassing Web site. During the past few years, the company has won several awards, mostly for Internet traffic.

One accolade that's not usually mentioned by the company is its 1998 Mud Brick Award for the ugliest Web site. The annual contest is sponsored by NetStudio Corp., which is a maker of Web-design

tools. Muddies are given to sites "only a Webmaster could love."

Despite such critical pans of the site, there are no such complaints about the software itself. ICQ regularly receives praise from industry insiders and Internet newbies alike as the best chat program available. As of press time, the ICQ program had maintained a position on the C|NET Most Popular Downloads list for more than 89 weeks. Little doubt remains that the four young men who sought "interconnectivity" have achieved it many times over. ▪

Spotlight features new chats, games, gestures, and other tidbits and pastimes. These two sections are set up like the rest of the site: oversaturation of information in an incredibly indigestible presentation.

Still, you needn't feel that you have to take what is spoon fed to you; the site offers multiple ways to find people with the same interests, concerns, collections, politics, and so on. You only need to turn to any of several ways to seek out similarly minded fellow chatters.

Seeking

ICQ.com offers multiple mechanisms to search its database of users. The ICQ Power Search sits underneath the two-box newsy headers. You can choose to search the site itself, which is a must-have tool for a site as complicated as this, or you can choose to use ICQ it!, an ICQ-powered engine, to search the whole World Wide Web. If your search isn't wildly successful, click the ICQ Power Search link to view more advanced search options.

The advanced options include searching the A to Z Topic Index or

choosing to do a People Search. Searching by topic opens up a menu that breaks down the alphabet and prompts you to choose the letter that corresponds to your subject of interest. For example, if you want to know if any other ICQ members talk about Bogota, Colombia, you'd choose Bk-Bz. Information listed under each topic includes the category and subcategories under which the selected topic falls. Our example, Bogota, is found under Cities In South America, which is a subgroup of By Cities And Towns. All the available ICQ features for Bogota, such as chat rooms or lists of user home pages, are displayed along with a key that explains what all of the many different symbols represent.

People searches are much simpler. Simply fill in the prompts for basic information, such as name, state, E-mail address, etc., and browse any matches from the ICQ member directory. A more detailed ICQ site search is included as well, which lets users specify the search to a specific location, such as all documents, Frequently Asked Questions, or User Created Lists.

Like many other features on the ICQ site, these options are located in several places on the Web site. Go back to the main page and take a look to the left of the What's New column. Scroll down to see another search-by-topic area. To the left of the columns is a clone of the aforementioned people-search tool. ICQ doesn't want you to overlook a single feature, so the company put them just about everywhere you might look.

The ICQ Most Wanted List, which is accessible through an icon in the upper-left side of the screen, showcases the chats where ICQ users are making the most noise. Although the inevitable Star Wars chat group made the Top 20 the day we looked, would-be Jedis were outnumbered nearly eight-to-one by lonely hearts in the Looking For Love interest group.

To enter a room, click a topic name and then the room you want. A page will appear where you can join the chat either through your Web browser or with ICQ.

Sending

As if chatting with regular text wasn't enough, ICQ.com offers a variety of ways to express yourself more fully. With ICQ Friendship pages, you can send special browser-based greetings to ICQ friends. Sound Schemes, which users all over the world provide, bring a touch of humor to the chat life. Not unlike the desktop themes Microsoft Plus! offers, ICQ sound schemes come in a variety of styles. "The Wizard of Oz" theme, for instance, features Dorothy saying, "Did you say something" in response to an incoming message. Similar movie sound bites announce your presence online, chat requests, and other events.

Because these treats move around, the best way to locate them is to look for large exclamation marks, smiley faces, and other friendly icons. Just click the link and follow the instructions. It's all really quite simple on ICQ.com once you find the feature you want. ▪

by Anne Steyer Phelps

Are your financial solutions designed to your specifications?

Let us help you build a plan for when you retire.
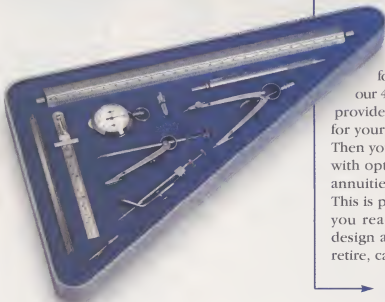
plan ahead.

To help ensure that you'll have enough to retire, you need a comprehensive financial portfolio. As a 401(k) plan leader with over a century of financial expertise, The Principal® can help. We offer a diverse array of financial solutions that can prepare you for the unexpected. First, our 401(k) and pension plans provide a strong foundation for your retirement program. Then you can further diversify with options like insurance, annuities, and mutual funds. This is planning that can help you reach your goals. To design a plan for when you retire, call 1-800-986-3343.

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Plan Ahead. Get Ahead.℠

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Web Tips

Ideas that Make The Most Of Online Time

Your Health In Your Hands

Mixing some prescription drugs with other prescription drugs, over-the-counter medications, and even certain foods can cause mild to severe reactions. If it seems as if you need a medical degree to decipher the information printout from the pharmacy, visit Drug Checker at http://www.drkoop.com /drug store/interactions. Here you'll find a detailed explanation of the medication you are taking, side effects, and any interactions of which you should be aware. Enter the brand or generic name and read the drug information; enter all the medications you're taking and check for possible interactions.

"No Hassle, No Haggle"

You really want a quote on that new Jeep Grand Cherokee or Ferrari 550 Maranello but are in no mood to quibble with a salesperson at a dealership and dodge phone calls for the next month. CarPoint's Auto-Pricer (http://car point.msn.com/AutoPricer/ Description) can show you the invoice in a matter of minutes. You can check off the options you want during the five-step process, and at no point are you under any obligation to buy anything. After choosing the trim and options, you'll see the base price plus your extras. You can end the session right here or continue through the selections and have a dealership contact you.

Death, Taxes & Mechanic's Bills

Cynicism aside, we all know cars are not indestructible. Cables snap on power windows, heat shields come loose, brakes wear out, and radiators spring leaks. If you own a car, eventually, you'll need a mechanic. Tom and Ray Magliozzi, better known as Click and Clack the Tappet Brothers, have a great resource called MechaniXFiles at http://cartalk.cars.com /About/Garage/intro.html. This searchable database lets users find a reputable mechanic (or bash a disreputable one). Scroll down to Search, click it, pick a state, narrow your search to a particular city, and read what other car owners have to say about your friendly neighborhood mechanic.

Let Them Hear You In Washington

Not knowing the address, phone number, or E-mail address of your congressman or senator is a poor excuse for remaining silent on issues. We elected them, and we have to tell them what we think about religion in public schools, gun control, and bans on public smoking. To find state and district information, telephone numbers, and representatives' Web pages, visit the directory for the 106th Congress at http://clerkweb.house.gov /mbrcmtee/mbrcmtee.htm.

Let your voice be heard! Write to your senator or congressman.

For the United States Senate, view the alphabetical list of hyperlinks to individual senator's Web pages at http:// www.senate.gov/senators /index.cfm. You'll find contact information, phone numbers, links to current activities, and much more.

Product Recalls

Potential killers in our homes rarely come in the form of teddy bears; but, many seemingly innocuous products do pose substantial risks to our children. Carbon monoxide detectors that don't work, softball bats that sheer off at the top, and bike chains that snap are among many products that were recalled in the last year. Frequently, unless there was a registration procedure, parents are the last to know when a product has been recalled for design defects or safety problems. KidSource Online (http://www.kid source.com/kidsource /pages/recall.html) has links to searchable databases of toys, clothing, household items, sporting equipment, and more. Take a few minutes to find out what has been recalled and why.

Implications Of A Graying Population

Despite all the media attention given to the "graying of America," most of us are too busy to plan our own retirement, let alone that of our parents. But what if you have to retire early to care for an ill parent or spouse? Fortunately, the American Association of Retired Persons (AARP) has given a great deal of thought to retirement and how to care for aging grandparents, parents, and spouses who require 'round the clock care. Visit Caregiving (http://www .aarp.org/programs/care giving/home.html) at the AARP Web site for alternatives to nursing homes, support groups for in-house care givers, and information about assistance with the financial obligation. ▐

by Katie Dolan

All-Knowing Numbers

Computer Mechanisms Reveal Users' Private Data

SOCIETY HAS A PASSION for privacy. Dead bolt locks, unlisted telephone numbers, Caller IDs, and alarm systems are just a few of the mechanisms people use to protect their privacy. These items, along with many others, allow people to choose what private information to reveal to others.

When it comes to digital data, however, it isn't as easy to protect your privacy. Digital content can easily reveal intimate details about users without their knowledge. For example, did you know that E-mail messages are as open as postcards for viewing? Some people can and do access private data from E-mail messages. When you send an E-mail message you run the risk of other people viewing the message's header, which contains your name and E-mail address, your recipient's name and E-mail address, the names and E-mail addresses of other individuals receiving the message, the date of the message, and the subject of the message. Plus, if someone intercepts the message, that person could also read the body of the message and your signature. (A signature usually contains a name, E-mail address, and sometimes a home and/or work address and phone number.)

Profiling

The sophisticated technology of today provides us with many sources for collecting and dispersing information. From the moment a user accesses his or her computer, she or he becomes the subject of profiling, the process of creating a file of a person's interests for use in targeting them as potential customers. The file is known as a profile.

For example, whenever you turn on your computer and use an application or the Internet, you are leaving a trail. This trail links documents and actions to you, exposing your identity, geographical location, actions, and tastes. Frequently, users do not know about or give their consent for this data gathering.

Profiling's primary use to date has been identifying consumers as possible customers. Marketers generally draw on the data holdings of multiple organizations to search out and acquire existing data on certain users. Additionally, marketers frequently sell information to one another. By doing this, information the user once thought private or restricted to a specific vendor becomes widely known and circulated.

Data Collecting Hardware

When Intel Corp. unveiled the Pentium III chip, it raised controversy with privacy advocates because of its Processor Serial Number (PSN). The PSN is a 96-bit number hard-wired into the chip. The encoded 96-digit serial number traces any online communication to a particular computer. The PSN is hardware-based and does not depend on users to manually enter any information into the computer. As long as the computer is in use, the PSN can provide a record of the users' online activities.

Because of the privacy controversy over this technology, Intel issued a software patch that allows users to "turn off" the serial number and hide it from prying eyes. However, a Montreal-based software company, Zero-Knowledge Systems, developed an ActiveX control that

exploits the 15-second gap between when the Pentium III chip is turned on and when the patch kicks in and covers it up. The program functions, and is classified as, a malicious code Trojan Horse. (A Trojan Horse is a virus that falsely appears to be a useful application.) The software retrieves the serial number and places it in a cookie file.

Cookies are small data files written to a user's hard drive by a Web site when the user views the site. Most of the time, depending on the user's browser settings, this happens without the user's knowledge. Cookies capture information about a user's habits and tastes. These data files contain information that sites can use to track the user's location, passwords, browser, and visited Web pages. Plus, cookies keep track of the last date a user visited a site and how long that person stayed at the site.

The German magazine *Computer Technology* also found a way to hack the controversial serial number. The magazine's hack exploits the machines deep-sleep mode, a form of hardware reset that doesn't actually turn the system completely off. When the chip is awakened, the PSN is active.

Data Collecting Software

Software divulges personal information, too. Microsoft's Registration Wizard (RegWiz) is of special concern. Any Web site can use this to read a user's Hardware ID (HWID) and Microsoft ID (MSID). The 32-digit MSID is in a cookie on the user's hard drive. Microsoft uses it to track a user's movements on its Web site. RegWiz also collects information on about 100 Microsoft and non-Microsoft applications a user can install on his or her hard drive. The RegWiz transmits the information to Microsoft when the user registers a Microsoft product by modem. Microsoft can also cull the information from cookies whenever a user visits its Web site at http://www.microsoft.com.

In addition, Microsoft acknowledges that Windows 98 (Win98) generates a fingerprint known as a Globally Unique

Identifier (GUID). Win98 secretly plants the GUID within electronic documents. This helps Microsoft trace authors' identities. This GUID is generally within the hidden software code of Office 97 Word, Excel, and PowerPoint programs. If the computer that produced the number has an Ethernet card, Microsoft can extract the GUID, which uniquely identifies the card and, subsequently, the computer. If the computer does not have an Ethernet card, a dummy or fictitious address that is the same for all machines is generated and the GUID is not traceable. All Macs have Ethernet cards so we assume all Mac users are identifiable via the GUID. The extent of fingerprinting, however,

Most Windows 98 users don't know that the Registration Wizard divulges their personal information to Microsoft Corp.

is not certain. We assume that in instances where compulsory registration is a requirement, the GUID affects the users registering.

Compulsory registration requires that the users identify themselves in order to receive the necessary authentication code from Microsoft. This authentication, in addition to attesting that the product is not a copy, provides users with updates, support, product news, access to product patches, and related information. Microsoft has been placing the Ethernet address of the PC as cookies on user's browsers that are transmitted to Microsoft's servers every time a consumer visits a Microsoft site.

Until Microsoft discloses the details of its GUID introduction, we cannot determine the extent of the problem. We know, however, that if a user produces a document and deletes from his or her reference to him or herself from the document and deletes all copies from his or her hard drive, Microsoft can still trace the document to the user through the GUID embedded in the document.

Streaming Media Fingerprints

Streaming media is also not exempt from monitoring. Both Real-Networks' RealPlayer and the Windows Media Player carry GUIDs. Those fingerprint numbers are transmitted to any site where you access a streaming media file. When you access a site, the GUID records your media-streaming activities. If you disclose your identity during the registration process, the GUID can trace your identity and location, and the GUID can associate your identity with any files produced by a program that adds fingerprints to files. Microsoft acknowledges the GUID, but it claims not to know the technical justification for its existence.

Browser Tattoos

Yes, even Microsoft Internet Explorer and Netscape Navigator can track your movements across the Internet. One feature introduced in Microsoft Internet Explorer 5 alerts the Web sites when a user has bookmarked a page. You cannot turn off this feature, but you can block it by using a proxy. A proxy is a privacy-enhancing software that blocks requests for universal resource locators (URLs, Web addresses) and deletes unauthorized cookies and other identifying header information exchanged between Web servers and browsers. Current versions of Internet Explorer 4 disclose a surfer's username to Web sites. The Smart Browsing/What's Related feature of Navigator lets Netscape collect massive amounts of information concerning an individual's browsing habits.

The most disturbing item related to the browsers are the browser bugs, including the ability of hostile applets (small applications) to record URLs and information entered on forms for later retrieval by a rogue site. This information identifies users, their preferences, and their activities on the Web without their knowledge. In addition to marketing, this information is used for forging E-mail messages, impersonating users on the Web, illegally using credit card numbers, solicitation through junk mail and E-mail, and watching individuals.

E-mail Trackers

As we mentioned before, E-mail message can easily transport private data to unintended recipients. Even when people delete these messages, they mistakenly think the ghosts of the messages are also gone. Deleting files actually leaves the file on the computer until you copy something else over the exact space. Before this occurs, special software can recover the file. Commercial services, schools, and businesses routinely keep copies of users' E-mail messages on their servers. According to the law, businesses have the right to recover and look at these ghosts.

A large part of our privacy law is based on the 1986 Electronic Communications Privacy Act, enacted before computers and E-mail achieved their current popularity. The law protects people from "unauthorized" access of electronic communication. Calling for criminal penalties for those who intentionally intercept electronic messages. The law, however, allows employers to monitor communications if a legitimate business purpose exists. A 1997 American Management Association survey showed two-thirds of employers monitor E-mail or use other methods to electronically eavesdrop on their workers and at least 25% don't inform the employees. Software packages such as Internet Watchdog and WebTrack enable secret monitoring of online activities including Web sites visited, time spent, and types of files downloaded.

Private Matter

Privacy as related to computers is still uncharted territory. As computer and Internet usage increases, privacy advocates will continue to challenge privacy violators, protect user rights, and campaign for legislation that specifically addresses the privacy rights of computer users. Groups, such as the Electronic Privacy Information Center, Junkbusters, Privacy International, the American Civil Liberties Union, the On-Line Privacy Alliance, the Progressive Policy Institute, Internet Privacy Coalition, and TRUSTe, are becoming increasingly vocal about the state of privacy violations and actions proposed to correct them. The World Wide Web Consortium is working on a Platform for Privacy Preferences that will let users determine how personal data is exchanged with Web sites.

The U.S. Constitution does not guarantee a right to privacy. Although the Fourth Amendment protects U.S. citizens against unreasonable search and seizure by the government, the rest of the population isn't mentioned. There is no law requiring employers to notify employees they are monitoring them. Laws concerning computer and Internet privacy are still being formalized.

The old adage "forewarned is forearmed" appears to be applicable. With the knowledge of how your computer can transmit private data, you can take steps to safeguard your privacy. ▐

by Diane E. Levine

Tips For Protecting Your Privacy

Here are just a few of the many methods you can use to safeguard your privacy.

- Use password protection to limit access to your computer, applications, and files.

- Download available patches from the Microsoft Windows Web Site (http://www.microsoft.com) to disable the Registration Wizard and remove the Globally Unique Identifier (GUID).

- Substitute other software for that of Microsoft when possible. Before you choose another product, make sure you check with the new vendor or a privacy associate regarding the use of GUIDs in these products.

- Don't send confidential information via unencrypted E-mail messages.

- Do use encryption, the encoding of information into a non-readable state, to prevent E-mail messages and documents from being read by unauthorized people.

- Delete E-mail immediately after reading it and use a special program to permanently delete all of your undesired files.

- Use anonymous remailers that allow you to post a message to a newsgroup and not reveal your name or E-mail address. See the Necromancers Web site (http://necromancers.nethosting.com/anonnmd.html) to send an E-mail message through remailers.

- Use filters that instruct your E-mail program about what to do with specific types of messages and block unwanted messages from being delivered to your E-mail address.

- Delete or edit cookies and install an anti-cookie utility. See the Junkbusters Web site (http://www.junkbusters.com) for an example of how to do this and an actual software download.

- Implement proxy software to block requests for universal resource locators (URLs). ▐

Readers & Viewers

Uncover Web Treasures By Using These Deciphering Applications

THE INTERNET just may be the world's largest treasure chest. Pearls of wisdom on how to find a new job, prepare for an interview, or write a cover letter are scattered throughout resume-posting sites. Gold trinkets in the form of online card games are overflowing for Bridge addicts. Furthermore, silver coins are up for grabs in the shape of Internet trivia contests, giveaways, and free coupons.

However, to take full advantage of these riches, you'll need to decipher them. Just like the fortune hunter who uncovers the missing treasure map only to discover it's written in code, those who find Web sites full of buried treasure may learn their newly discovered valuables will remain a mystery without the key to unlocking them. In other words, not all files that you find online will display their information without a little effort on your part.

To better illustrate how readers and viewers help Web surfers uncover buried treasure, let's analyze a feasible example. Suppose you are considering starting a business of your own. You jump online to look for tax tables, laws, and general information on starting a business in your state, and you discover About.com's (formerly The Mining Company) guide to government agencies with small-business startup resources (http://desktoppub.miningco .com/library/weekly/blstatebiz.htm?rf= dp&COB=home#startup). You scroll down the page and read the various links, such as "Establishing A Business In Alaska," the "Business Resource Guide" for Colorado, or "An Introduction To The Use Tax" in Hawaii.

You click the link you want, but instead of seeing documents display in a new Web page, you receive the message that the files are of an unknown type and you can't open them.

That's because these documents are all .PDF files, which require users to use a certain type of software to read these files online. Just as you can't read text files without a word processor or view Web pages without a Web browser, you can't read or view certain files, such as .PDF files, without a reader that can handle them. By the way, PDF refers to Portable Document Format, which is appropriate because the documents go from the creator to the recipient and appear on the recipient's computer as the creator intended. In this case, the .PDF files we mention require a special reader, Adobe Acrobat, to display them.

You can easily download the Adobe Acrobat Reader for free, along with a number of other readers and viewers. Here, we take a look at some of the various types of text and graphics files you're likely to find as you hunt for treasure online. We'll also show you how to find and use the software you'll need to display these gold nuggets.

A Primer About Readers & Viewers

Fortunately, many file types are universal. Almost any PC has the ability to show you a text file (one with a .TXT extension) or a common graphic file such as a .JPG or .GIF file. Sometimes, however, your computer can't display a certain file type. That's when you need a reader or viewer.

A reader or viewer can refer to many types of programs. At the most basic level, it's a piece of software that shows you a file. For example, Eudora is a popular E-mail reader, which is a program that displays E-mail messages. Readers and viewers also may offer added functionality. For instance, they may let the user manipulate files or convert them into other formats.

In addition, Web surfers use readers and viewers to display many types of files. For example, you can use them for sound (RealPlayer is a must-have for listening to sound clips via the Web) or video (many news sites rely on QuickTime to display sporting events and breaking news). Due to space constraints, however, we'll confine the content of this article to text and static graphic viewers.

Why Use Them?

Using a special reader may sound like a nuisance. You have to locate the reader, download it, install it, and figure out how to use it. But installing the software usually is an easy process and there's a big benefit to using these programs; they let you view files that carry a richness that wouldn't be possible without the readers.

For example, the aforementioned .PDF files can display text and graphics in a layout similar to that of a newspaper page or splashy brochure, complete with columns, drawings, and stylized text. If your computer isn't equipped with a spreadsheet program, you can still view Excel spreadsheets using an Excel reader. Or, if you're using an older version of Microsoft Word, you can see all the formatting of a later version by using the free Microsoft Word Viewer 97.

So how do you know if you need a reader? One sure way is to try and open a particular file; the file could be an attachment within an E-mail message or perhaps one that you downloaded from a Web site. If your computer gives you an error message and tells you it does not associate an application with the chosen file, or if all you see is a bunch of gobbledygook, then chances are good that you don't have the appropriate viewer.

That leads us to the next, obvious question: How do you find an appropriate reader or viewer? There are many strategies users can employ to solve this riddle, but the right answer will depend upon why you need a particular reader or viewer.

Surfing For Software

Here's one likely scenario. You're surfing the Web, and you discover a site that lets you download and view chapters of books; however, the chapters are stored as .PDF files. The good news is that most Webmasters don't assume you already have the appropriate reader, therefore, they'll usually put a link on their site to Adobe (http://www.adobe.com), for example, the maker of Acrobat Reader.

The same is often true of PowerPoint files. Most Webmasters won't assume you have PowerPoint software on your computer, so they'll usually include a link to a PowerPoint viewer.

Another way to find readers or viewers is to go right to a software manufacturer's home page. For instance, Microsoft offers viewers for several of its products. So, if you don't have PowerPoint on your PC, then download the free Viewer for PowerPoint 97 (http://www.microsoft.com/Office/000/viewers.htm). If you need to look at a proposal written in Microsoft Word, then download a Microsoft Word viewer, as well.

Another efficient way to obtain readers and viewers is to visit some of the online software stores, such as CNET's Download.com (http://www.download.com). Here, you can either search for a particular reader by keyword or browse the site by software category.

One of the great things about these shareware and freeware sites is that they often will include product reviews so you can compare the various types of readers and viewers. For example, there are scores of free, downloadable graphics viewers on the market today, and a site such as Freeware Home (http://www.freewarehome.com/index.html) can help you determine which program offers you the features you need. For more information, see the "Best 5 Sites" sidebar.

Specific Locations For Readers & Viewers

Now, let's look at some of the more popular readers and viewers available online. So far, we've mentioned a great deal about the Adobe Acrobat Reader because PDF is an extremely popular file format. Let's walk through setting up your computer to display .PDF files.

First, to install a free copy of the Adobe Acrobat Reader, head to http://www.adobe.com/ prodindex/acrobat/readstep.html#reader, where you'll see a set of easy-to-follow instructions. In the first section, choose

Make Sure You Get The Right Program

Granted, getting new software these days is often as easy as clicking a "download" button on a Web site. But just because you can doesn't mean you should. Before installing a new viewer or reader program, take a minute or two to ask yourself the following questions.

• Do I really need this software? Viewers can be quite useful, helping you sure tasks that your computer can't otherwise handle. Many of the file formats online are fairly universal, however, so your computer might automatically display that word document or graphic without any assistance. Before downloading a reader or viewer, try to open the file you want to view and see what default program your computer launches.

• Will the program eat up too much hard drive space? Almost all download sites will tell you how large the file is before you open it. To see if you have enough room for it, open Windows Explorer and click About Windows 95/98 in the Help menu. The dialog box will indicate how much memory is still available.

• What are the program's limitations? You don't want to go through the trouble of downloading a text viewer only to discover that you need to download a different one next week. With so many readers and viewers on the market, you'll want to choose one that provides you with as many features as you need. Read the software's documentation to learn exactly

what the program's features are.

• Am I required to input my E-mail address? Many download sites offer you free software in exchange for information—your personal information. If a site requires you to type in your E-mail address, be aware that whatever address you give them will certainly be sold to junk E-mailers. If a site asks for your E-mail address but doesn't require it, opt to leave that data field blank.

• Can I uninstall the program? Be sure to read the Readme.txt file before launching the program and review the uninstall instructions. Then, when your system overflows with unnecessary files, you can easily refer back to the Readme.txt file to clear out any obsolete programs. ∎

the appropriate language, operating system, and location, then leave the option for searching .PDF files blank. It's also a good idea to leave the second section blank, unless you want to receive commercial E-mail on topics such as Web publishing. Finally, click the Download button in the third section and save the file on your hard drive (after making sure your computer meets the system requirements, of course).

Once you save the file, click it to install it on your computer, then follow the on-screen directions. Any time you download a .PDF file from the Web, you'll need to launch your Adobe Acrobat Reader from the Program menu and choose Open from the program window's File menu, just as you would with any word processing document. Your browser, however, might also do all the work for you when it comes across any Web page requiring Acrobat Reader.

As we mentioned earlier, another popular text and graphics viewer is a PowerPoint viewer. This is primarily because PowerPoint presentations are common, but not all computers come equipped with PowerPoint software.

One example of a situation when you might need to obtain a PowerPoint viewer is if you've just received a longtime client's account at work and your boss sends you a PowerPoint presentation via E-mail that illustrates the type of work your company previously did for this client. You don't have PowerPoint on your computer, so you open your browser and head directly to http://officeupdate.microsoft.com/downloadDetails/ppview97.htm to download and install the free viewer. When it's up and running, you'll be able to view and print PowerPoint presentations; you just won't be able to edit them.

Microsoft offers viewers for several other applications in its popular software family, including Word and Excel. Therefore, even if you already have a version of Word on your PC, you may still need to download a copy of Word viewer because each

update Microsoft releases involves various enhancements that can make it difficult to view files that are written on a later version of Word. Fortunately, thanks to Microsoft's viewers, you can still see these files even if you're using an older version of Word—and without investing in an entirely new software package.

In addition, you can browse to CNET's download library at Download.com (http://www.download.com) and look for the word processing files under the Business category. You'll find four different Word viewers and converters, as well as details about each one. Or, in the spreadsheet area under the Business category, you'll find numerous Excel-related viewers.

Microsoft and Adobe don't have a monopoly on text readers, however. There are a number of other text readers and editors, as well as programs that actually let you edit the text, not just view it. Many of these products are also available as free downloads. Also, like most users, you already have two basic text editors on your Windows operating system, Notepad and WordPad (under Accessories in the Program menu), but they may not always get the job done.

Jumbo!, an online software store, features some robust text editors/readers at http://www.jumbo.com/pages/int/sections.asp?x_sectionid=14517. Take a look at TextPad 32, which lets you edit Web pages, or check out UltraEdit-32, a text editor with features such as spellcheck and the ability to handle large files.

Along with text readers, you may eventually need to install a graphics reader. Most pages display graphics in standard formats, but once in a while, a colleague might send you an E-mail message with an unreadable graphic. Or, maybe you just need to convert a graphics item from a common file format to an obscure one, such as converting a .JPG file to a .PNG file.

A highly recommended graphics viewers is IrfanView32, a freeware

program for Windows 95, Windows 98, and Windows NT. To see what it's all about, see the Web page at http://members.home.com/rsimmons/irfanview/english.htm.

Another favorite graphics viewer is PicViewer, which carries several features including a slide show, animated .GIF files (those cute little icons you see dancing around on Web pages), and an image converter. Although this product is not free, it doesn't cost very much (around $20), and it still makes a good investment. To find out more, head to http://www.strongsoftware.net/dronix/eng.html.

Finally, for more information about graphics viewers and the best collection online, be sure to visit Freeware Home at http://www.freewarehome.com/index.html.

No matter which viewers and readers you use, they give you the keys to opening some of the greatest online treasures. Just don't forget to share the wealth with others. ∎

by Heidi V. Anderson

How Will I Know When The Right One Comes Along?

Amy Johnson, your city is on SALE!
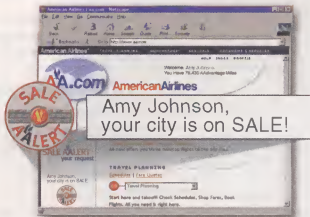
Meet the AA.com™ new Sale AAlert feature. It's a match made in... The Caribbean. Or Paris. Or even your hometown. Just tell us where you want to go, and AA.com will notify you on your personalized home page whenever that destination's on sale. Sale AAlert will even give you the "lowdown" on specials out of your home airport. Love that low fare? AA.com's innovative booking tool lets you buy it right online instantly. The new Sale AAlert feature, only at AA.com. Built around you, there's no other site quite like it.

The ultimate web site for everything **American**Airlines

Look Like A Pro, Part I: In Print

Tips To Help You Master Desktop Publishing & Create Stunning Projects

IF YOU LONG TO PRODUCE brochures ablaze with creativity and business cards with panache, you aren't alone. However, desktop publishing is no longer the sole domain of graphics professionals. Anyone with a fairly powerful computer and some beginner-friendly desktop publishing software can create printed materials with ease.

Despite the power and potential at their disposal, many would-be designers are frustrated by their inability to achieve a truly polished look. As a result, they've settled for less than-professional results. However, the secret to professional results lies not in the capabilities of the equipment, but rather in the knowledge base of the user. This month, we'll show you how to master your print projects. Next month, we'll show you how to look your best on the World Wide Web.

Design That Shines

Creating awe-inspiring, award-winning designs may require inspiration and talent, but producing compelling, professional-looking documents does not. Many graphic designers spend their entire careers producing competent marketing materials that attract attention and increase sales (exactly what they are intended to do) without ever raising eyebrows or winning accolades from their peers. These professionals achieve solid results with ease by following a proven set of guidelines regarding what does and doesn't work in the printed world.

Many novice designers want to fly on the cutting edge of avant-garde design, so they break these rules at will. Sometimes the results are amazing, but other times they are merely unsettling. Unless you are aiming at a very unconventional market, don't break these rules when you are designing the business card, brochure, or advertisement that will market you, your products, or your services. Do so and you may brand yourself as an eccentric or, even worse, a rank amateur.

The Right Tools For The Job

The first secret to good design is to use the proper software for the job at hand. Many publishing programs can do just about anything, but nearly all of them excel at one aspect of the process or another. There are four different types of programs used in desktop publishing: word processing, page layout, drawing, and photo editing.

If you intend to get serious about your work, you'll need one of each. Use the drawing program to create and manipulate clip art and vector-based graphics; the image-editing program to work with photographs; and the word processing program to create and spell check your text. Then, pull all the elements together in a page layout program. Don't take shortcuts by trying to use a one-program-fits-all approach. Doing so will only result in frustration and, quite possibly, a useless product. In addition, do not use any other type of software, such as a spreadsheet or presentation program, to create artwork.

Illustration: Mark Monlux

If you're thinking about having your work commercially printed, call a printer and ask for advice about which software to use. If you find your programs aren't compatible, don't despair. Many computer stores sell used software that is very capable of doing what you need it to.

Learn From The Pros

For many projects, particularly brochures, business cards, and other standard marketing materials, most designers follow standardized formats. Many of these are available as templates (blank documents already set up with the proper margins, spacing, and even typestyles) either in your desktop publishing program or as add-ons from the software manufacturer or a third-party supplier. Some of these templates even include color bars and other graphic elements to jazz up your materials.

Don't hesitate to use templates when you find ones you like. You will still be personalizing the piece with your own efforts, and you'll be streamlining the design process considerably by using these standardized formats.

By the way, the concept of creative borrowing holds true for printed pieces that you find appealing. While you certainly wouldn't want to duplicate someone's materials, there is nothing wrong with adopting ideas that work in other pieces. Many graphic designers keep an "idea file" in which they store visually appealing pieces that can provide inspiration.

Less Is More

One of the biggest mistakes novice designers make is thinking that just because they have a wide variety of options at their disposal, they should use them all. Fonts (the design for a set of characters, which includes typeface, point size, and height) are one of the most poignant examples. Most desktop publishing packages automatically install up to several hundred fonts on your system. As a result of this

abundance, we've seen projects where well-intentioned designers used a dozen or more fonts on a single page.

The best strategy for the majority of documents is to use a maximum of three fonts in any document. Choose one font, preferably a serif font (characters that have short decorative lines attached to the upper and lower ends of characters in a typeface), for body text. (Use italics and bold formatting sparingly.) Then, choose either the same font or a different, complimentary font for headlines. If you need a third font for emphasis or contrast, go ahead, but try to stop there.

The same rule holds true for graphics such as clip art. While visuals add interest, too many can create confusion. Try to hold your use of graphics (both

clip art and photos) to one or two per page. In addition, white space (blank areas on a page), is one of the most powerful design devices you can use. White space gives the eyes a place to rest and adds impact to the visual elements. Don't fill up all your white space with busy text and graphics.

Connect The Dots

If you want to produce professional-looking printed materials, you're going to have to learn a little bit about how they are produced. Take a close look at the printed images in this magazine. You'll see that while the picture may look solid, it's really made up of thousands of round dots, bunched so closely together, that from a distance,

Find Your Type

In addition to minimizing the number of fonts you use in a design, there are a few other tricks that will make your work more reader-friendly. These suggestions hold true for all printed material, but they are particularly important when long blocks of text are involved.

Pick a legible text face and size. In a magazine, book, or brochure, the main bulk of the type is called body text or body copy. Body text is most legible when it is in a serif face. (A serif is a short decorative line attached to the upper and lower ends of characters in a typeface. Times is a serif face; Arial is a **sans serif** [no serif] face.) Sans serif faces are hard to read in large blocks, as are script faces, which have a cursive appearance. Top choices for body text are

Garamond, Times, Goudy, and Century. You also should keep point sizes for text to between 8 and 14 points, with 9 to 12 points being the average.

Fine-tune headlines. The default tracking (space between letters) for type in most programs is designed for body copy. When you increase the point size for headline type, the tracking is often thrown off. Even the most rudimentary page layout software, such as Microsoft Word, allows you to adjust tracking. Find out if your publishing program offers this feature and use it.

Get the lead out. Leading (the amount of space between lines) must be even throughout a body of text for maximum legibility. If all the type in a block of

text is the same size, your page layout program should handle the leading automatically. If you adjust type sizes (as you might for emphasis) you'll have to find the program's leading feature and manually adjust the setting. Proper leading for body copy is 120% of the point size (for instance, 12-point leading for 10-point type).

Avoid setting headlines in all caps. Headlines set in all uppercase letters (capitals) are harder to read than headlines set in both upper- and lowercase. That's because type is designed to be used in upper- and lowercase, and it flows better when used this way. An added problem is that uppercase headlines can take up a lot more room than upper- and lowercase ones. ∎

they blend together. The better the quality of the print, the more tightly the dots are packed together.

The same is true for your monitor; your screen display is composed of dots although you can't see them. The unit of measurement for both printed materials and monitors is **dots per inch** (dpi). (The dots displayed by a monitor are square, and are referred to as pixels, but they are basically the same thing.)

Most monitors display images at a rate of 72dpi; a desktop printer prints files at anywhere from 300 to 1200dpi, and a commercial printer usually produces material at 2,540dpi. Photographs and other bitmapped images are also made up of dots, or pixels (this is not true of clip art, or vector images, which don't use dpi measurements and can be enlarged or decreased at will). To get the best results, you need to match up the dpi of your bitmapped images to the intended method of printing. Fortunately, there is a formula to help you do this.

The printed resolution of a document will be about 10 times the resolution of the images used in it. The minimum resolution at which you'll find most graphics files is 72 dpi. Using this formula, a 72dpi image will print well to a printer up to 720dpi. A commercially printed piece, on the other hand, would require images with a minimum of 250dpi (many printers will ask for 300dpi). If your images don't look sharp or have jagged edges (jaggies), you probably need to bump up the resolution of the bitmapped images you are using.

Increasing resolution is fairly easy to do; there are only a given number of dots in a graphic. If you have a graphic that is 10 x 8 inches at 72dpi, and you want to increase the dpi to 150, you'll have to use the image at approximately half the size. That's because as the dots move closer together, the image gets correspondingly smaller.

There should be a way to do this in your image-editing program, such as PhotoDeluxe or Picture It!. Look for a menu option such as "image size." When you select it, look for a box that shows dpi (also referred to as resolution). Change it from 72 to 150, and the size of your image should change correspondingly. If it doesn't, it means the image editor is trying to increase the number of dots, which isn't always a good idea. You may have to find an option such as "maintain file size" to prevent this from happening.

If you are stuck and you really need a larger picture than what you have after increasing the dpi, you can try allowing your image editor to enlarge the file, and then apply a sharpening filter to clarify the image. Nearly all image editors have a "sharpen" tool; for example, PhotoDeluxe's is in the Advanced section under Quality.

If you want your work commercially printed, always use 300dpi images. You can use them for desktop printing as well because the printer will throw away what it doesn't need.

Let It Bleed

In the printing world, **bleed** means to allow an image to run off the edge of the page. If you are producing a basic business card on white paper stock, you won't need to worry about bleed. If you are creating a brochure with a full-color photograph on the front, you can greatly enhance the look of the piece by letting it bleed off the page. There are two ways to do this. The first is to take it to a commercial quick printer.

The second, less-expensive option, particularly for small quantities, is to use specialty papers from companies such as Avery and paperStudio. Both vendors sell 8.5 x 11-inch perforated sheets of paper in a variety of weights (thicknesses) that match the standard sizes for business cards, postcards, etc. You print your masterpiece on these special papers, taking care to align it properly to a provided guide sheet, and then fold and tear carefully along the perforations.

There may be slight fuzziness where the perforation occurs, but it's fairly minor. Your piece will have to be less than 8.5 x 11 inches, of course, but the space you'll lose will be compensated for by the appearance. The finished products won't be as heavy as commercially printed versions because the card stock has to be light enough to go through your printer. But for inexpensive color or instant gratification, you can't beat them.

1. Logo design should be consistent. If you want to print it in different colors, choose a set pattern and stick to it. Do not alter the base artwork from one printed piece to the next.

2. If you have a tag line, decide where and how it will be used. While it's OK to use it in different ways on different forms, the color, type style, and size in relation to the logo should remain consistent.

3. Don't change the color of your logo or related art without reason. The color of your logo is an important part of your identification.

4. Minimize the number of fonts, or typefaces, you use on a job, and keep them consistent from one job to the next—even if it's just an address line.

Paper Perfect

In addition to the perforated papers, there are now a wide range of specialty papers you can use to create a polished look. Many inkjet printers will print on glossy stock; for example, paperStudio offers its perforated cards in a very high-gloss finish. In addition, many paper manufacturers make glossy paper specifically for an inkjet.

Even if you don't want the shine that comes with glossy stock, buy the best paper you can. Paper is graded by weight and brightness (whiteness). Inexpensive copy paper is thin and has a grayish cast; a better grade of paper will feel heavier and look more professional.

Another option is to use preprinted paper. Paper Direct is a leading supplier of papers that are preprinted with a variety of snazzy four-color graphics. The company offers dozens of themes, each of which is represented in business cards, brochures, invitations, and more.

Go Commercial

If quality is really important, you can't beat a commercially printed piece. While it's still quite expensive to create the film and plates required to print on a true printing press, digital and high-end color printers have made producing small quantities of even four-color work affordable. Copy houses such as Kinko's can print your piece on oversized paper, trim it down to allow for bleeds, fold it, and even bind multiple pages together, often overnight.

With these tips, you can boost your printed pieces to near-professional quality. Even so, we've barely scratched the surface of print production. Fortunately, today's desktop publishing software is becoming increasingly complex and self-sufficient. As a result, much of the knowledge formerly required to produce even the simplest business card simply isn't needed anymore. ▌

by Jennifer Farwell

Pocket Guide To Production Terms

Printed materials are composed of three main elements, fonts, artwork, and photographs; all of which are reproduced on paper using one or all of four ink colors, cyan (C), magenta (M), yellow (Y), and black (K), or CMYK. Before you begin working, it may help to know a little more about each term.

Fonts. Fonts, or typestyles, come in two formats, TrueType or PostScript. The differences between the two are subtle and confusing; just remember TrueType fonts are the type preferred for 90% of desktop printers while PostScript fonts are preferred by 90% of commercial printers. Start with TrueType, but be prepared to substitute fonts if you decide to have something professionally printed.

Artwork. Artwork, which technically can include photographs, is often used to refer to the nonphotographic visuals used in a project. There are two formats for computer artwork or graphics: vector and raster (bitmapped). You can convert vector images to raster images, but you can't convert raster images to vector format.

Vector graphics are produced by drawing programs, such as CorelDRAW!, and the computer creates them by using a series of mathematical equations. As a result, you can infinitely resize them up or down without impacting quality. Vector graphics usually have large areas of solid color, but most drawing programs can create subtle blends to simulate the effect of shading and depth. Even so, the blend will be created using a precise number of steps leading from one color to another.

Vector graphics come in a variety of formats with Encapsulated Postscript (.EPS) and Windows Metafile (.WMF) being two of the most common. For logos and artwork that will be resized and do not require photography, vector-based graphics are the best choice.

Raster (bitmapped) graphics are composed of tiny squares of color called pixels. Raster images enable very smooth transitions between colors. Often, illustrations and other original (noncomputer-generated) artwork are scanned in and saved as raster images. Because raster images are composed of pixels, you cannot enlarge them without a reduction in sharpness. Raster graphics are most commonly used for the Web and they are not the preferred choice for printed material.

Photographs. Photographs are always raster images. Like raster graphics, they cannot be enlarged without a corresponding reduction in sharpness. Photographs (and raster graphics) are usually saved in tagged image file (.TIF) or Joint Photographic Experts Group (.JPEG) format. JPEGs are smaller in file size, but they may lose quality when they are repeatedly opened and resaved. For best quality, always use TIFFs for raster images.

CMYK. The four colors used by printers to create a full-color effect (some desktop printers use only CMY and simulate black). The important point to know about C, M, Y, and K is that they are not the same colors used by your monitor, which uses red (R), green (G), and blue (B), or RGB. The RGB spectrum can create 16.7 million colors; the CMYK spectrum can create only a few thousand. For that reason, you may not always get the same color on paper that you see on your monitor. ▌

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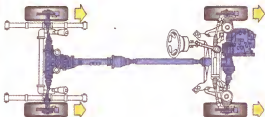
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Smaller Yet Bigger

Tiny Form Factors & Larger Capacities Mark Storage Evolution

PORTABLE STORAGE DEVICES follow the same rules as nearly every other computer peripheral—the sizes decrease, the features and capacities increase, and prices constantly decline. Notebook computers, handheld computers, and products such as digital cameras have all fueled the drive for leaner, meaner storage equipment. Today manufacturers are producing devices thought impossible just a few years ago.

The versatility these latest products afford is incredible. Imagine the ability to share one storage device between a PC, digital camera, printer, video game device, and nearly anything else electronic. In addition to sharing information between disparate devices, new memory products are easier to use and require no manual installation routines, making them truly plug and play.

We will be looking at advances being made in solid state and mechanical storage devices, as well as the current state of smart cards and how they will affect our lives in the upcoming years.

Solid State Devices

Solid-state memory and storage devices store information on chips that have no moving parts. This makes these types of devices resistant to damage from temperature changes, violent impacts such as falls, and other mishaps that could damage a mechanical device with moving parts. Solid-state devices also generally offer better performance, with faster data access times because no parts have to move around to find and retrieve information.

SanDisk's CompactFlash

SanDisk Corp.'s CompactFlash product line has been an established standard for years. These cards are about the size of a matchbook and store data using flash semiconductor chip technology, which means they hold information similar to the way your computer's RAM does, except they retain it after you turn off the power. You can also use the cards with

a PC Card adapter, which makes them compatible with notebook PCs.

At the low end is the company's $39 four-megabyte (MB) card, while the largest 96MB CompactFlash card sells for $299. For users with even bigger storage needs, SanDisk offers its ATA line that employs the full Type II PC card form factor. These drives hold up to 220MB of data, with the most capacious model selling for $899 (408/542-0500; http://www.sandisk.com).

Pretec's Flash Media

SanDisk is encountering competition from Pretec Electronics Corp., which recently introduced a new 160MB CompactFlash card. The company claims the device, which has yet to hit the market, offers enough storage for a one-hour movie or five hours of compressed music. These cards are the same size as SanDisk's products, measuring 36.4mm x 42.8mm x 3.3mm. By the end of the year, Pretec says it will have new cards in capacities of 192MB, 256MB, and 320MB (510/440-0535; http://www.pretec.com).

Sony's Memory Stick

Sony Electronics Inc. recently rolled out its latest entry in the compact storage fray, along with a variety of products to take advantage of it. The Sony Memory Stick is about the size of a stick of chewing gum, measuring .85 hundredths of an inch wide x 1.97 inches long x .11 hundredths of an inch deep. Early models held 4MB to 8MB of data, but the latest ones store from 16MB to 32MB. Sony plans to incorporate the Memory Stick's proprietary interface into a number of products.

Memory Sticks have a read speed of 2.5MB per second, which makes them too slow for running applications. Instead, the company says the products will serve as a common storage media that users can share between their PC, printer, digital camera, camcorder, and nearly any electronic device sporting the proprietary interface. Capacities

should increase while remaining compatible with the products available today. It should be interesting to see how pervasive the little Memory Sticks become. Prices range from $30 for a 4MB stick to $130 for the 32MB model (800/222-7669, 941/768-7669; http://www.sel.sony.com).

Mechanical Devices

Although solid-state storage products have certain advantages over mechanical devices, nobody should discount the products with moving parts (especially when cost is an issue). As the size of many of today's mechanical devices decrease, their storage capacities just get bigger. Many of the current devices are fast enough to let users treat them like normal hard drives, albeit without the hassles of installing a new hard drive.

Iomega Clik!

Iomega Corp. dominates the removable storage arena with its Zip and Jaz products, so it is only fitting the company should also attempt to tackle the super-compact storage market. Its latest product is the Clik! drive, a removable storage device that uses 40MB media. The regular drive is available with a parallel port interface. There's also a PC Card interface that lets users insert a Clik! disk into a PC Card adapter for use with their notebook PC.

Clik! disks measure 2 inches wide x 2 inches long and have a street price of $100 for a ten pack. The drive itself sells for about $200, and it is likely that future versions of the drive will be compatible with the current Clik! media (888/446-6342, 801/332-1000; http://www.iomega.com/clik/index.html).

IBM Microdrive

IBM Corp. recently announced a compact storage breakthrough with its Microdrive, a 340MB hard drive that fits in a one-inch diameter case and weighs only twenty grams. One of the greatest assets of the $499 drive is it is compatible with the CompactFlash

Type II interface, a popular interface already in use on several electronics products. That lets users plug the new drives directly into existing devices.

The new drives have specifications similar to a mid-range-priced hard drive, with a rotation speed of 4,500 rotations per minute and a random seek time of 15 milliseconds. It uses only 3.3 volts as opposed to the 5 volts used by most CompactFlash products, which means longer battery life of the portable device it's plugged into. IBM also offers a 170MB model, but had not announced actual pricing prior to press time (888/411-1932, 914/499-1900; http://ssdweb01.storage.ibm.com/hardsoft/diskdrdl/micro).

Calluna's Callunacard

Few notebook PC users like to use Type III PC Cards because by portable standards they take up a lot of room. Callunacard may just change their minds. This product from Calluna Technology Ltd. is a shrunken-down

IBM's Microdrive fits in a one-inch case.

one gigabyte (GB) hard drive that performs like a fixed hard drive. The beauty of this device is it requires no setup or installation procedures, meaning users can slide it into their computer's PC Card slot and go to work. There is a 512MB model, as well as a 260MB drive that fits in a Type II PC Card slot. The 1GB card sells for

$699(408/778-6563;http://www.callunacard.com)

Smart Cards

None of the products or technologies discussed so far have the potential to affect your life more than smart cards. These credit card-sized devices come in a variety of configurations but share the common purpose of providing a small amount of storage in an extremely small area for the lowest cost possible.

The magnetic strip on the back of a typical credit card holds 140 bytes of data. Typical smart cards can hold one to 16 kilobytes (KB) of information, and some can store nearly 5MB. Some smart cards even have an internal, short-range antenna that lets the cards interact with a card reader without making contact with it, which makes high-speed transactions possible.

Smart cards do more than just store information. They also interact with the data via their built-in microprocessors, performing mathematical calculations and sorting information just as a normal computer would. This means most smart cards are not dependent on a card reader or an external database to perform transactions. When a credit card is swiped, the information has to travel to a database for authorization. When a smart card is "loaded" with money, tokens, or other data, it can send that information directly to a card reader, or exchange it between cards.

Smart Cards will interact with the new computerized appliances expected to arrive in the next few years. So your refrigerator might be able to download a grocery list to the smart card, which you could use at the grocery store to help find items, store coupons, and then pay.

Smart cards are poised to invade or enhance every aspect of our lives, depending on your viewpoint. Soon we won't be discussing the possibilities of these technologies, but living them. ▪

by Tracy Baker

Microsoft Excel 97

Using File Properties

Do you remember the "Unsinkable Molly Brown?" Molly was unforgettable because of her unique personality. In a sense, your Excel workbooks also have distinctive personalities and characteristics that define them: their file properties. A file property is information, such as the author, creation date, title, and keywords, specifically related to the file.

File properties are handy for two main reasons: to find out information about a file and to group files by common properties so you can quickly find just the file(s) you want. In this tutorial, we will explore the ways you can view and change file properties in Excel. We will also show you how to automatically display the Properties dialog box each time you save a file so you do not forget to set them.

Setting File Properties

Excel sets some file properties automatically whenever you save (or re-save) a file; you must manually add others. To view the preset properties for an open workbook, open the File menu and select the Properties command to display the Properties dialog box. Next, click the General tab to see information about the file's name, location, size, and file attributes. This page is informational; you can't change its contents. Then, click the Statistics tab to see the creation and modification dates, which author made the most recent changes, and the total editing time.

If you are itching to make some manual changes to your file's properties, display the Summary tab, which includes text boxes you can use to set your spreadsheet's properties. For example, you can assign a descriptive title—different from the file name—to the workbook. You can also fill in the Subject or Category field with a brief synopsis, such as employees.

On this tab, you can even change preset data. Excel will fill in the Author and Company Name field based on your system's setup informa-
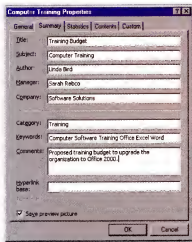
Use the Properties dialog box to set the characteristics for each of your files.

tion. Just highlight the preset information and type in the new data.

Finally, you can check the Save Preview Picture box so Excel saves a snapshot of the first page of the workbook. Choosing this option allows you to preview the file in the Open dialog box, but it also increases file size. You need to weigh the pros and cons carefully before you decide to use this option—otherwise you will be wasting space.

When you finish viewing, entering, and/or modifying properties, choose OK to close the Properties dialog box and then save the file. The last step is important because Excel will not actually associate the properties you set until you save the file.

Setting A Reminder

You can change file properties for a workbook at any time by opening the file and then displaying the Properties dialog box. If you tend to be forgetful, however, you can set Excel's options so the Properties dialog box automatically displays when you initially save the file. To do this, open the Tools menu, select Options, and then click the General tab. Check the box for Prompt For Workbook Properties. Click OK to implement your changes and to close the Options dialog box. The next time you save a new file Excel will automatically display the Properties dialog box.

Finding Files By Their Properties

So what do you do with the file properties once you set them? One way to use them is to locate similar files. First, open the File menu and select the Open command to display the Open dialog box. Enter the property by which you want to search for the file in the Text Or Property field and click the Find Now button. For example, if you entered a person's name, such as "Sarah Rebco," as the Manager property in one of your files, you could search for all files with the same manager name. You would type Sarah Rebco in the Text Or Property field.

If you want to search for information you entered in the Keywords and/or Comments field of the Properties dialog box, then you will probably want to search for a phrase. To do this, enclose the text with quotation marks. For example, you could search for "Rebecca's production report."

Take a few minutes to set file properties for each of your workbooks—and make your files as unique as Molly Brown. ▐▐

by Linda Bird

Quicken Deluxe 98

Using The Check Register

- *Personal Finance*
- *Beginner*
- *98 for Win*

The most basic element of Quicken 98 Deluxe is the check register. Proper entry of data into the register is the key to receiving the most benefits from other areas of the program. We'll show you exactly how to use the checking register. (Other registers, such as investment registers, are slightly different.)

Finding The Register

If you haven't yet created a register in Quicken, click the File menu and the New command. Click the New Quicken Account radio button and click OK. Follow the step-by-step instructions to create your new account.

Once you finish creating your account, switch to the register view by clicking the Register tab on the right side of the screen. If you have multiple accounts, click the tab for the account you want to use at the bottom of the window.

Once in the register, you will notice that, by default, each transaction occupies two lines. You will also see the Date, Number, Payee/Category/Memo, Payment, Deposit, and Balance columns. When entering data for a transaction, Quicken allows you to select data for each column using mouse clicks or by using the TAB key. For the most part, however, you'll find entering information goes faster when you type the data and move between columns using the TAB key.

Using The Register

Start by entering the date of the transaction in the Date column. You either can type the date or you can click the Calendar button in the Date column to select a specific date. (The Calendar button will appear on the right side of the Date field only after you click in the field.) Use the TAB key to move to the next column or click the next column.

When you enter the Number column, a pop-up menu with a list of items, such as ATM, Deposit, and Transfer, will appear. (If this is your first transaction, you will need to click the down arrow to open the menu.) If you simply want to type a check number, begin typing and the pop-up menu will disappear. Otherwise, you can click one of the items in the menu. If you are printing checks through Quicken, for example, choose the Print Checks command.

When you move to the Payee column, another pop-up menu will appear. (If it doesn't, click the down arrow.) The menu will list all the payees for whom you've previously entered transactions. If you click one of the payees in the pop-up list, Quicken will automatically fill in the remainder of the columns with the same data you used in your most recent transaction with that payee. You can edit the data if it has changed. If you're entering a new payee, begin typing the name and the pop-up menu will disappear.

Press TAB to move to the Payment column. Type the amount of the payment and move to the next column. If you're entering a deposit instead of a payment, press TAB twice to move from the Payment column to the Deposit column. Type the amount of the deposit and press the TAB key. Note that you can't enter amounts in both columns. If you enter an amount in the Payment column, Quicken will skip the Deposit column when you press TAB. If you don't want to type the amount in these columns, click the Calculator button to select the amount by clicking the calculator's buttons.

When you then move to the Category column, Quicken will list its collection of income and spending categories. Click the category from the list that most closely matches the nature of your transaction. If the transaction belongs under multiple categories, click the Split button. You don't have to enter a category; just press TAB to skip this column. However, Quicken uses
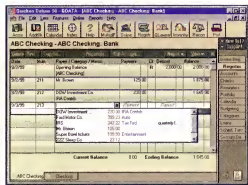
Quicken attempts to save you keystrokes by displaying pop-up menus each time you enter a new column.

these categories for budgeting purposes, which means your budgets and spending reports won't be as accurate if you leave the column blank.

The Memo column gives you a chance to type a reminder about the transaction. Entering data here is optional; press TAB if you want to skip the Memo column. If you never want to see the Memo column, switch to a one-line display by clicking the View button at the top of the register and then clicking the One-Line Display command.

To finish, click the Enter button to save the transaction. Quicken should make a cash register sound and advance the cursor to the next transaction line. You can return to a previous transaction to edit it any time by clicking the transaction. ∎

by Kyle Schurman

Going Online

Track Your Packages Online

- *Online*
- *Beginner*

You can't force a parcel through your modem, but you can use the Internet to figure out where in the real world the packages you send and receive are at any time.

One of the main benefits of using delivery companies such as FedEx, United Parcel Service (UPS), and certain U.S. Postal Service services is that your packages are not anonymous as they move through the system. Everything gets a number, and the companies use those numbers to keep track of packages every step of the way. The good news for customers is that the Internet makes it easy to tap in to those databases from the office or at home.

All of the major package services let anyone who knows a tracking number look up the progress of packages in transit. The ability is handy whether you're on the sending or receiving end. Did you just sell that lifetime collection of gum wrapper foil on eBay? You can make sure the package arrived at your buyer's address. Finally order that dog backpack you've had your eye on? Now you can track the precious cargo as it winds its way to your door.
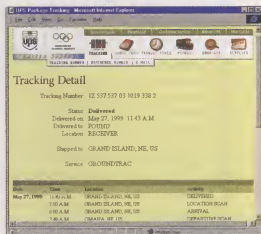
Postal Service

The Postal Service isn't famous for tracking shipments, but the main Web site at http://www.usps.com now offers online tracking for Express Mail and Priority Global Mail, as well as delivery confirmation for domestic Priority Mail and that old standby, Parcel Post. Delivery confirmation means you can't see where a package is while in transit, but you can find out whether or not the item arrived.

From the Postal Service home page, click the Track/Confirm link near the top of the screen. The page that appears includes an input box where you can type the item number that was on the package receipt form. Delivery confirmation information is available by the evening of the delivery or

United Parcel Service, like many delivery services, lets both senders and recipients of packages track shipments online.

attempted delivery. The Web site will let you know if the attempt was successful and whether the item was forwarded or returned.

UPS

Those innumerable brown trucks double-parked around the world carry more packages than you can shake a clipboard at, and just about all of them are traceable through http://www.ups.com. Simply click the Tracking link at the top of the page.

The default search option lets you track by the tracking number, which is the numbers UPS automatically assigns to each package that comes into its system. Senders should easily be

able to find this number on the UPS address form they filled out. Recipients will have to ask their senders for this. Enter up to five numbers at a time in the form and then click Track. The Web site will then return a list of everywhere the package has been in the UPS distribution network thus far.

UPS allows senders to write their own reference numbers on address forms. Click the Reference Number link to find your package by that number instead. It also is possible for users without Web access or who simply like E-mail better to send numbers to a special address and then have the information delivered to their inbox. Check the bottom of the Track By Tracking Number page for details.

FedEx

The company formerly known as Federal Express today features a slimmed-down name and a full-featured Web site (http://www.fedex.com) for accessing services online. Select the country in which you live, and then click the Tracking link. You can enter up to 25 Airbill numbers at a time for tracking, but be sure to enter only one number per line into the box. When you're finished, click Request Tracking Info. The FedEx site returns a detailed list of stops your package has made during its journey.

Most of these companies also use the Internet in other ways to make shipping packages easier. For instance, FedEx's Web site lets account holders print out airbills on their own printers, keep track of addresses, look up shipping histories, and quickly pay via credit card.

Taken together, the package-delivery business and the Internet present a powerful new resource for merchandise ordering and shipping. The companies that deliver packages to your address now use the Web to deliver a little peace of mind. ▐▐

by Alan Phelps

Microsoft Word 97

Importing & Exporting Files From Other Word Processors

- Word Processing
- Intermediate
- 97 for Win95

To share Microsoft Word 97 files with someone who does not have Word, you must save your document in a format the other person's application can read. Choose Save As from the File menu, click the arrow next to Save As Type, then choose an appropriate format from the drop-down list. You'll find several options for other Microsoft products (Word for Windows, Word for DOS, Microsoft Works, and Windows Write) and several types of WordPerfect file formats for DOS and Windows. You can even save a document in Hypertext Markup Language (HTML) format for publishing on the World Wide Web. Unfortunately, newer versions of WordPerfect do not appear on this list. In addition, there are no filters for Lotus Word Pro (formerly Ami Pro) or Apple's Apple-Works (formerly ClarisWorks).

There's no point in selecting a file format that the destination word processor can't open. If, however, the destination computer has a newer version of an application available on the Word Save As Type list (for example, WordPerfect 9), saving the document in an earlier version of the original application (for example, WordPerfect 5.x for Windows) will at least produce a file the other machine can open. Be aware, though, that saving in another format may result in the loss of some formatting.

When saving a file in another format, don't be too quick to click Word's Save As dialog Save button. Instead, click the dialog's File Name box, then modify the name of the document you're saving. This prevents Word from overwriting the original document with a document of the same name but a different file type. Be sure to put a period and the correct three-letter file extension associated with the destination word processor at the end of the name (for example, .wpd for WordPerfect files, .wps for Microsoft Works files). Word automatically puts a .doc extension on any file name you create, but you can remove this extension once you save the file. Simply exit Word, navigate to the location of the document you just saved, right-click the document icon, choose Rename from the context menu, and delete the .doc extension.

Rich Text Format

If you and the person with whom you'd like to exchange files have no applications in common, you still have several options for sharing documents. Every word processor can read ASCII text files, so choose Text Only from the Save As dialog's Save As Type drop-down list, rename the document, then click Save. Text Only is preferable to Text Only With Line Breaks because it preserves the paragraph breaks of the original document. It does not, however, preserve other text formatting, such as type size or type style.

If the destination application can open rich-text format (RTF) documents, select this option. RTF-formatted documents are specially formatted text files that preserve most Word formatting, including margin settings, font selection, type style, type size, and tab settings. As a result, the overall look of an RTF file closely resembles the original.

(NOTE: Saving a document in rich-text format strips all macros from the file. Thus, RTF is an especially useful file format for file exchange between computers [even if both systems have installed versions of Word] because it minimizes the risk of infection from macro viruses.)

Opening Files Created In Other Applications

While a newer version of a program typically can open an older version of that same program, older programs cannot always open documents created by newer versions. Similarly, if Word has a file converter for an earlier version of a particular application, this converter may not be able to handle documents created by newer versions.

Don't give up. For example, if someone sends you a WordPerfect 8 document, you can still open it in Word even though Word's Open dialog doesn't list WordPerfect 8 as a
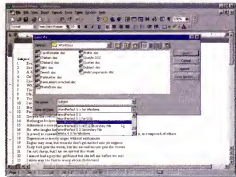
Microsoft Word 97 allows you to save a document in formats supported by other applications, but your choices are limited.

supported file type. To open such a file in Word, double-click the document's file icon. The Windows 95/98 Open With dialog box appears, asking you to click the program you want to use to open the specified file; select Winword and then click OK. To have Word continue to open this file or any file with a .wpd extension whenever you double-click the file's icon, be sure to place a check mark in the box next to Always Use This Program To Open This File in the Open With dialog box. ▐▐

by Carol S. Holzberg, Ph.D.

WordPerfect 8.0

Comparing & Reviewing Documents

A document is rarely written perfectly the first time. It usually undergoes a series of changes before the final version is developed. As changes are made, it's often beneficial to track them, especially changes by someone else.

Saving the original file and working off of a copy preserves the earlier version, but it would be a time consuming task to manually compare documents to see what deletions and additions were made. Fortunately, WordPerfect automates this task with its Document Compare feature.

This feature lets you compare the current version of a document to an earlier version to see how the two differ. By default, deleted text is displayed as strikeout text, while text that has been added or moved is displayed as redline text. As indicated by the name, this text is red and underlined. You can change those settings if desired.

Adding Comparison Markings

When you compare two documents, markings are added to a copy of the current document to indicate text that has been deleted, added, or moved. Open the current version of your document. Click File, Document, Compare. Under Compare This Document, accept the default entry of Current Document, or click the browse icon to select a filename. In the To Original Document box, enter the filename of the document you want to compare it to.

Click Settings to specify the color and appearance of comparison markings. Make choices under the Insertions tab to control the appearance of inserted text; use options under the

Deletions tab to specify how deleted text should be marked. Your selections will be displayed in the sample text box. When finished, click OK. Then click OK again to compare the two documents.

Your original and current documents are still intact. A new document window contains a copy of your current document, marked to indicate changes that have been made in comparison to the original document.

Add further markings to indicate redline text by clicking File, Document, Redline Method. Select a
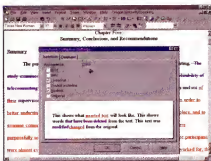
Use Document Compare Settings to specify the appearance and color of marked text when comparing documents.

margin where the mark will be located. If you want to change the redline character from a pipe (|), use the character text box to enter a marker of your choice (such as an asterisk). To enter a non-keyboard character, press CTRL-W and select one from the Symbols dialog box. This new marker will display and print in addition to the markings specified earlier.

Reviewing Documents

Another way of tracking document changes is by using Document Review.

This feature lets the author of a document forward it to others, who then make editing changes. As reviewers make modifications, the insertions or deletions are color coded so each person's changes are displayed in a different color. When you read the document later, you can accept or reject the suggested changes individually or as a whole.

If a document is forwarded to you as a reviewer, open the document, then click File, Document, Review, Reviewer. If necessary, enter your name and initials and click OK. In the Document Review toolbar, select Set Color to choose a color from the color palette. This will be used to identify your changes. The Other User Colors box will display a list of reviewer names and their associated colors.

Make your changes to the document, then save it. The author will not be able to review your changes unless they have been saved. To review a document as an author, open the document, then click File, Document, Review, Author. The Document Review toolbar will include several buttons you can use to manipulate the marked text.

Click the Color Display button on the far left to toggle the color display on and off. When you first open the document, the first change will be highlighted. Use the directional arrow buttons to move from change to change. As you do this, you can accept or reject each one.

A set of four buttons to the right of the directional arrows lets you accept or reject the current annotation (change) or accept or reject all annotations at once. When you accept a change, it is inserted into the document and is no longer color coded. If you reject an annotation, it is removed from the document.

Sometimes you'll find it necessary to return to your starting point. As an added safety measure, always save the original document. ∎

by Diane Kaye Walkowiak, M.A.

SHOP FOR HARDWARE

AND SOFTWARE IN YOUR UNDERWEAR

You're ready to shop for a new computer? But you're too busy to leave your computer?
Shop for hardware, software, you know where: on-line. You'll find all the computer stuff you need.
It's fast. It's safe. It's a lot easier to browse the web.

VISA

Worldwide. Webwide. Visa® It's everywhere you want to be®

Lotus 1-2-3 Millennium Edition

Sharing Data Between Applications

- Spreadsheets
- Intermediate
- 9 for Win95

Lotus 1-2-3 teams up with several other products, including Word Pro, Approach, and Freelance Graphics, to provide a comprehensive set of productivity tools.

The tight integration of SmartSuite products means you don't have to duplicate your efforts or risk losing important data when transferring it from one application to another. Like you, Lotus 1-2-3 can operate by itself or as a member of a team.

Copying & Pasting

The most fundamental way to exchange information between programs is to use the Copy and Paste commands under the Edit menu. For example, to copy data from a Lotus 1-2-3 workbook to a document in Word Pro, open both applications. In 1-2-3, select the data range you want to copy, then click Edit, Copy. Next, switch to Word Pro, position the insertion point where you want the information inserted, then select Edit, Paste.

You may want to do the reverse and copy information such as a Word Pro table into 1-2-3. Select the table in Word Pro, then click Edit, Copy. Switch to 1-2-3, position the insertion point, then select Edit, Paste.

Charts in a 1-2-3 can easily be copied to Word Pro or Freelance Graphics. Select the chart in 1-2-3, then click Edit, Copy. Switch to the other application, place the insertion point where you want to insert the chart, then click Edit, Paste.

Keep in mind that copying and pasting data is a static operation. If the original data changes, the pasted information in the destination file will not reflect the changes made in the original.

Some objects such as charts paste as embedded objects, so updated information is retrievable from the source object. Assume you copied a 1-2-3 chart into Freelance Graphics. With both applications open, double-click the pasted object in Freelance to display its Properties box. Use the Properties options to change the type of chart, its style and layout. To update the chart so it matches changes made in the 1-2-3 chart, select Import Data under the Data tab. Select the worksheet cells that contain the appropriate data and click OK.

Linking Data

Manually updating information in the destination document is not very convenient. If you want the pasted data to match the original as changes occur, you can create an active link between the two. With an active link, any changes made in the source file will be automatically made in the destination file.

Do you need a 1-2-3 chart in a Freelance Graphics presentation? It's easily copied from one place to another.

The steps for copying and pasting linked data are the same as described above, except that instead of selecting Edit and then Paste, you choose Edit and then Paste Special. In the dialog box that appears, click the object in the As list (for example, Lotus Chart or Text Unformatted). If you are pasting text, click the Paste Link To Source radio button. When you have made your selections, click OK to insert the data. To maintain the link, remember to keep both the source and destination files on your computer or network so they can always refer to each other.

Beyond SmartSuite

SmartSuite's "sticky" file format lets you save files in the format they were opened in. You can open a Microsoft Excel file in Lotus 1-2-3, make modifications and save it back in its original Excel format.

If you are making the transition from Excel to Lotus 1-2-3, click Help, Help Topics. On the Contents tab, select What's New?, then Information For Excel Users. Confused about menu differences between Lotus 1-2-3 and Excel? Click Help, Microsoft Excel Menu Finder to display the Excel menu in a window. Click any item to see the similar command in Lotus 1-2-3.

Lotus' team approach is particularly helpful in a corporate setting, offering increased collaboration between employees, customers, and suppliers who might be using different products. ∎

by Diane Kaye Walkowiak, M.A.

Print Shop Deluxe

Creating Custom Calendars

- **Desktop Publishing**
- **Intermediate**
- **6.0 for Win95**

Now that summer is at its end, settle back into the office routine by presenting your staff with a personalized company calendar. Use the Calendar project in Print Shop Deluxe 6.0 to design customized calendars that list meetings and other important company events.

Calendar Design

It takes only a few mouse-clicks to create personalized calendars. Launch Print Shop, click Calendars, click Help Me Design, and then click Next. In the Select A Calendar Type window, click Monthly, specify the design's year and month, and then click Next. Print Shop's calendar is set to your computer's clock, so you only have to change the year if you're designing a calendar for a year in the future. Click Next. Choose Tall (portrait) or Wide (landscape) orientation from the Select A Window dialog, select a paper size from the Paper Size drop-down list, and then click Next. Print Shop then displays its Select A Backdrop window.

Backdrops frequently intrude on a Print Shop design and compete with text for a reader's attention. To ensure everyone focuses on your calendar message rather than its design, omit the backdrop. Put a check mark in the box next to No Backdrop and click Next.

Insert the Product CD, and choose a layout from the Select A Layout window. Layout 2 has the most room for text, so we'll select that one. In other layouts, graphic illustrations assume prominence. Click OK.

Print Shop opens the project on the Design Desk. To diminish the visual impact of this layout's placeholder backdrop, you need to bring the image to the top layer of the project and adjust its tint. To bring the backdrop forward, send the top layer to the back. Press and hold the CTRL key, then click anywhere on the calendar grid.

You will now see handles around the grid design. Open the Arrange menu, select Layer, then click Send To Back. The graphic backdrop becomes the top layer. Right-click the backdrop, select Tint Object on the pop-up context menu, then select 10% from the list to make the picture as light as possible. Right-click the backdrop to return it to the bottom layer so you can customize other objects. Choose Layer, Send To Back, and then click anywhere on the Calendar grid to deselect the backdrop.

To customize the Calendar heading, double-click it. In the Create A Headline window, enter new or additional headline text, then modify this object's font, type style, object alignment, color, and look, then click OK. To make room for the additional headline text, enlarge the headline box by click-dragging its handles.

To edit the contents of a calendar cell, double-click the cell or right-click it and choose Edit Cell from the context menu. The Edit Day window appears, allowing you to add a graphic and enter text. To insert a graphic, scroll the images in the Edit Day's Graphic box. Click one to select it and see a thumbnail preview in the Preview box. Next, click the Color bar beneath the graphic window to open the Color Palette. Choose a color for the image, then select a tint from the Tint drop-down box to lessen the graphic's intensity.

To add a text message to the cell, click in the Text Box and type your message. Customize the look of this message by highlighting it in the Text window, choosing a different font, adjusting type size and style, or applying a distinctive color. You cannot, however, control horizontal or vertical placement of text and graphics in a calendar cell. To have Print Shop circle this date on the calendar, put a check mark in the box next to Circle Date then click OK.

For consistency, choose one color for text and a second for graphics, then use these colors throughout the calendar unless you want to draw special attention to a particular day or event. It's easy to repeat a color application because Print Shop keeps a record of your six most recently selected colors in a toolbar at the top of the Color Palette. Click to apply any one of these colors.

Choose a graphic for a selected calendar cell, then modify that graphic's color to make it more attractive.

To copy the contents of one calendar cell into another, right-click the cell you want to copy and choose Copy from the pop-up menu. Then, right-click the other cell and choose Paste. Open the File menu and click Save to name your project and save it to the proper directory. To convert the calendar into HTML format for posting on a Web site, choose Export As HTML from the File menu. ∎

by Carol S. Holzberg, Ph.D.

Web Browsers

Importing & Exporting Favorites

- Online
- Intermediate
- Internet Explorer & Navigator

As you browse the Web, bookmarks or favorites files become an all-important personalized guide to the Internet. Some people might consider the prospect of losing their bookmark file with the same dread reserved for the potential destruction of important financial information.

Lucky for you, Microsoft Internet Explorer (IE) and Netscape Navigator both feature options for saving extra copies of your bookmarks and favorites or for sharing them between programs if you decide to switch from one to the other.

Backing Up

Many people forego backing up every file on their system and instead only back up user-created documents. If you're on the Internet much, you should be sure your bookmarks or favorites files are included in your backup set. Navigator stores bookmarks in a single file called Bookmark.htm, which you can find by using Windows' Find command in the Start menu. If you encounter more than one Bookmark.htm, you can save all of them or open them in your Web browser to see which one contains your links. You can also can simply make a copy of your Navigator bookmarks at any time by pressing CTRL-B while in Navigator to open the Bookmarks window and choosing Save As from the File menu.

While Navigator bookmarks are actually links in a single standard Hypertext Markup Language (HTML) file, IE Favorites are individual Windows shortcuts grouped together in the Favorites folder, which is inside

the Windows folder. Your backup program should be able to include the entire Favorites folder in the list of files it saves during its periodic trips through your hard drive.

Switching Browsers

Moving from Navigator to IE or vice versa doesn't mean you have to leave your precious bookmarks behind. IE5 includes an import/export utility that will read Navigator files or transform your Favorites folder into a standard Bookmark.htm file.
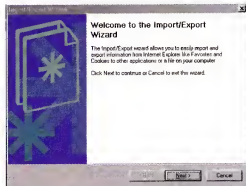
Internet Explorer's Import/Export Wizard lets users save their Favorites as a Netscape Bookmark file.

To transform Bookmark.htm into a folder full of Favorites, open IE and choose Import And Export from the File menu. A new screen appears, calling itself the Import/Export Wizard. Click Next to begin and choose Import Favorites.

Now you must choose to either import favorites from an application or a specific file. Choosing Application may be easiest if you don't know exactly where the Navigator bookmarks are stored. If Navigator is set up for different user profiles, you will need to choose the correct name from the

drop-down list. On the other hand, if you happen to know the exact bookmark file you want to import, or if you want to bring in bookmarks from a diskette or some other source not associated with one of your profiles, choose File and browse to the file location.

After you click Next, the wizard presents your own Favorites folders setup and asks you which folder should receive the imported bookmarks. Choose one, click Next, and click Finish. Open up your Favorites and you'll see they're all in the same folder arrangement originally created in Navigator.

Switching from IE5 to Navigator is just as easy with the Import/Export Wizard. This is a good way to share your list of Favorites with Netscape-using friends or to create an HTML file of Favorites that you can open in a Web browser or post to your Web site. To start, select the Import And Export command from the File menu.

This time, however, choose Export Favorites on the second screen. The wizard asks you to choose a source folder. If you want to export only one subfolder's worth of Favorites, pick the correct folder. Otherwise, just make sure the top folder, Favorites, is highlighted. Click Next.

The wizard asks you to choose either Application or File. Again, Application is easiest unless you know exactly where you want the Favorites to go or you plan on saving them to a diskette or a standalone HTML file you can send via E-mail to other people. After you select the destination, click Next and then Finish.

Older versions of IE do not include the Import/Export Wizard, and Navigator only deals with standard HTML files. You can download a tool similar to the wizard from Microsoft at http://www.microsoft.com/msdownload/ieplatform/favtool/favtool.asp. The applet comes in handy for people who can't live without their favorite bookmarks. ▪

by Alan Phelps

Microsoft Works 4.5

Using Headers & Footers

- **Integrated software**
- **Intermediate**
- **4.5 for Win95**

If you ever print files longer than one page—and who doesn't?—then you know how important it is to keep those documents straight. Headers, which Works prints atop every page, and footers, which can include such essentials as a document's title, date, and page numbering. Spreadsheets, databases, and word processing documents in Microsoft Works 4.5 can all have headers, footers, or both.

In A Text Document

The word processing tool is a great place to learn about headers and footers because adding and editing them is practically the same as typing the rest of the document.

Start by selecting Page Layout under the View menu. At the top of your document, you'll see a gray box underneath the word Header. At the bottom of the screen, you'll find the word Footer below another gray box. To begin adding a header or footer, simply move the mouse to either box, click the mouse button, and start typing. You can adjust the font, style, and alignment the same way you change the rest of the document. Add as many lines as you want; Works readjusts the spacing.

To add the page number or document name, select either option under the Insert menu. Either the word "page" or "filename" appears between asterisks, and Works inserts the information when you print the document. If you want the pages to say "1 of 7 pages," "2 of 7 pages," and so on, the text should look like this: *page* of 7 pages. (Don't forget the blank space after "*page*".)

You can also add the date and time, again by selecting that option under the Insert menu. In this case, you'll select a format. The current date and time will appear in the header or footer line, but if you check the Automatically Update When Printed box before you click Insert, a new date and time appear whenever you print.

To exclude headers and footers from the first page—for instance, on a title page—select Page Setup under the File menu. Under the Other Options tab, check No Header On First Page or No Footer On First Page.

If you select Normal under View, you'll notice the header and footer both appear at the top of the document, next to an H or F on the left-hand side. You can edit them from this view, too. (*NOTE: Even if the headers and footers are set not to appear on the first page, Works displays them on the top of the Normal View.*)

If you add these codes to a header or footer in a spreadsheet or database (but *not* a word processing document), Works inserts the appropriate information when you print the document.

code	meaning
&p	page number
&f	file name
&d	current date (in numerical form)
&n	current date (written out)
&t	current time
&c	center the following characters
&l	left align the following characters
&r	right align the following characters
&&	ampersand character

To see how the final headers and footers look, go to Print Preview under the File menu. Press the Next button to see how all the pages look.

In A Database Or Spreadsheet

Adding headers and footers to databases and spreadsheets is almost as simple. Rather than typing them straight in, however, select Headers and Footers from the View menu.

In the resulting dialog box there's a line for a header and for a footer. To create a title page, mark the options.

It gets a little trickier if you want to adjust the alignment (the default is centered) or add the file name, current time, or page number. You'll have to type in one or more of the codes we've listed in the box to the left. For instance, if you type Report &r&p, the word "Report" will be centered, and the page number will be aligned to the right.

Aside from those codes, Works doesn't let you format the headers and footers. They will appear in a simple font and cannot be more than one line each.

Again, use Print Preview to check your headers and footers.

Adjusting Margins, Page Numbers

You can set the margins for headers and footers separately from the rest of the document. Under the File menu, select Page Setup, then go to the Margins tab. You will see the area on the right-hand side where you can adjust these margins.

If the document you're working on is part of a larger work, you may want to change the starting page number. Select File, then Page Setup, and go to the Other Options tab. Use the arrows to adjust the Starting Page number to coincide with the previous file. Or you can set it to 0 if the first page is a title page you don't want counted. ∎

by Sarah D. Scalet

PowerPoint 97

Using The Slide Finder

- **Presentations**
- Advanced
- 97 for Win95

Combining slides from several PowerPoint presentations is a time-consuming and inefficient process. For example, to mix slides from several monthly sales presentations into one large presentation, most of us would copy and paste each individual slide into the new presentation. There is, however, an easier method: You can use the Slide Finder to combine information from multiple existing presentations. This feature allows you to effortlessly combine entire presentations or just select the specific slides you want to use.

Getting Started

Your first step is to open the presentation into which you want to insert slides. You can combine presentations in any view except Slide Show. You will probably want to choose the Slide Sorter view from the View menu, however, because it's easiest to see the results of your actions in this view.

Your next step is to select the slide that is just in front of the place you want to insert the slides from a different presentation. Choose the Slides From Files command from the Insert menu to display the Slide Finder dialog box. This dialog box gives you quick access to the existing presentations on your computer or your company's intranet. Use the Find Presentation tab to locate any presentation on your system or click the List Of Favorites tab to see files you have previously added to your Favorites.

Choosing Slides

Now you are ready to locate the presentation slides you want to use. First,

make sure you are working in the Find Presentation tab. If you already know the name and location of the presentation you want to use, then you can simply enter it in the File field and press ENTER. On the other hand, if you don't know the location of the presentation you want to use, click the Browse button to display the Insert Slides From Files dialog box. The layout of this dialog box is similar to the Open dialog box and you use it in much the same way. For example, you can click the Look In drop-down list arrow to choose the drive and folder where you think your files are stored. After you locate the appropriate drive and folder, click to select the presentation you want. Choose Open to display the presentation—complete with slide miniatures in the Select Slides area—within the Slide Finder dialog box. (If the slides don't automatically display, don't panic. Click the Display button.)

If you prefer, you can display the presentation in the Slide Finder as a list rather than as slide miniatures. This helps you get an overview of your presentation because you can quickly scan the slide titles. To switch from slide miniatures to a list (or vice versa), click the buttons above the Select Slides area. When you view the presentation as a list, you can select a slide title on the list on the left pane and then preview the selected slide in the right pane.

No matter which way you display the slides, you have the option to pick and choose which ones you want to insert into the open presentation. To select adjacent slides, press SHIFT while clicking the first and last one you want in the Select Slides area. To select non-adjacent slides, press the CTRL key while clicking the slides. After you select the slides, click the

Insert button. Alternately, if you want to insert the entire presentation in a flash, choose the Insert All button. If you are particularly observant, you will probably notice that PowerPoint immediately inserts the slides into the open presentation and that the inserted slides use the open presentation's design template.

You will also notice that the Slide Finder dialog box remains open after you insert slides from a presentation. That's so you can repeat the process as many times as you need to, even if you need to insert slides from other presentations, as well.
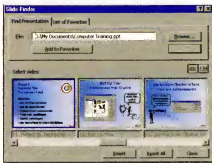
The Slide Finder feature in Microsoft PowerPoint helps you easily combine slides from multiple presentations.

Adding To Favorites

Finally, if you feel you will often want to insert slides from a particular presentation, make sure you save it as one of your favorites. First, make sure it displays in the Slide Finder dialog box, then click the Add To Favorites button. This places the presentation on the List Of Favorites tab, making it easy to locate the presentation in future work sessions.

When you finish working in the Slide Finder dialog box, click the Close button to clear it, and take a look at your new, combined presentation. Make sure you save your updated presentation before you close it. ∎

by Linda Bird

HTML

JavaScript Popup

- *Online*
- *Advanced*

A great way to add a sense of activity and excitement to a Web site is to use a popup window, which you can use to showcase what's new on your site. You can create a popup window using a few lines of JavaScript and, if you attach it to your home page, it will display whenever a visitor loads your home page. (*NOTE: The minimal browser requirement for this operation is Internet Explorer 3.x or Netscape 3.x.*)

Create the popup by adding some simple JavaScript inside the <HEAD>... </HEAD> tags:

```
<SCRIPT LANGUAGE =
"JavaScript">
<!--
//
function loadPopUp(){
whatsnew=window.open("what-
snew.htm","whatsnew","width=250,
height=275,top=50,left=50"); }
//-->
</SCRIPT>
```

Rewrite the <BODY> tag on your home page so it looks like this:

```
<BODY onLoad="loadPopUp()">
```

Create the page that will appear in the popup window by copying the sample code available at http://www.smartcomputing.com and save it as a text file called Whatsnew.htm.

JavaScript code is case sensitive. and this should not have spaces. Ensure the text from "whatsnew=window.open" to the closing bracket ("}") appear on a single line:

```
"width=250,height=275,top=50,
left=50"
```

Testing The Code

Before you can test your code you'll need two small pages called Resume.htm and Writing.htm. All these pages need contain for now is a line of text such as:

```
<HTML>
<HEAD>
</HEAD>
<BODY>
This file is called resume.htm
</BODY>
</HTML>
```

Test your popup by loading your home page in your browser; you can do this on or offline. When your home page opens you'll see the popup window appear over it. You can click one of the links to view that page or close the window by clicking the Close Window button.

How It Works

The JavaScript in your home page creates a function called loadPopUp, which opens a new browser window 250 x 275 pixels in size and loads the page Whatsnew.htm into it. This function occurs whenever the home page loads using the onLoad event handler in the <BODY> tag. The function creates a new browser window using the window.open method. This allows you to set various attributes for the window. Here you can set attributes for the popup window.

The page Whatsnew.htm appears in the popup window, and it contains links to two pages on your site. In this case, the pages are Resume.htm and Writing.htm, along with a Close Window button.
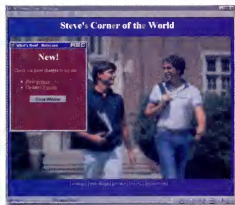
If your visitor clicks a link on your home page, it will be replaced by the page they have selected to view. This is controlled by the JavaScript function loadPage in whatsnew.htm. If your visitor selects the Close Window button, the onClick event handler calls the closePopUp function, which simply closes the current Popup window.

Changing The Code

You can easily personalize this code for you own use. You can alter the universal resource locators (URL) of the pages that the popup window links to. This is so that the links refer to pages on your Web site. Do this by altering the code in Whatsnew.htm, replacing the references to Resume.htm and Writing.htm with your own file names. To add more links, copy the existing ones and alter them to suit your needs.

You can also add an image to your popup window by including an image tag in Whatsnew.htm, which as in the tag below, displays the image New.gif in the popup window:

```
<IMG SRC=new.gif>
```

Estimate around 175 pixels in width and height to be a good size. You can also change the dimensions of the popup window or its location on the screen by changing the width, height, top, or left settings. To do this, alter the JavaScript in the <HEAD> section of your home page. ∎

by Helen Bradley

Quick Tips

Secrets To Succeeding At Common Tasks

Bootable Diskettes

✓ Personal computers can lull you to sleep and make you unprepared for a digital disaster. If you have an emergency bootable diskette, you will at least have access to basic DOS commands that can help you get Windows up and running again. In Windows 95 and Windows 98, open the Control Panel and double-click Add/Remove Programs. Select the Start Up Disk tab and click Create Disk. Win95 will automatically create a bootable diskette, but it will lack CD-ROM support. Win98, on the other hand, creates a bootable diskette that includes generic CD-ROM drivers.

Microsoft Word

✓ In Microsoft Word, to separate text into two or more columns, highlight the text, then select Columns from the Format menu and click the number of columns you want. If you'd like to separate the columns with a line, click the checkbox next to Line Between. To force a column break, click the cursor once where you want the column to end. Then select Break from the Insert menu, click the Column Break radio button, and click OK.

✓ Microsoft Word can help you quickly enter large portions of text that you find yourself using frequently. Type and select the text portion you wish to duplicate. In Word 95, click AutoText from the Edit menu. In Word 97, select AutoText from the Insert menu, then click AutoText from the submenu. When the dialog box displays on-screen, enter a name for the block of text you highlighted, and then click OK. Now, the next time you need to enter that text into a document, simply type the name you entered and press F3.

PC Sound Schemes

✓ Choose a sound scheme for Win9x events through the Sounds icon in the Control Panel. When the Sounds Properties window opens, you can select a different sound scheme for each of the different Windows functions listed under Events.

By clicking the Sound icon from the Control Panel, you can change sound schemes for events listed in the Sounds Properties window.

Netscape Navigator

✓ If you start each day reviewing business news or sports scores, create shortcuts to these sites so you can access them quickly from your Desktop. In Navigator (versions 4.0 or 4.5), go to the Web page you want to save as a shortcut, move your mouse pointer over the Page Proxy icon (located between Bookmarks and Location/Netsite). When the mouse pointer changes into a hand, click and drag the Page Proxy icon to any blank space on your Desktop to make a new shortcut icon appear. Double-clicking one of these shortcuts automatically launches Navigator and displays the shortcut's Web page on-screen.

Outlook Express

✓ Save yourself time by creating a standardized signature to attach to the bottom of the E-mail messages you send. For instance, you may wish to include your business address, a personal Web address, and a favorite quote. If you're an Outlook Express user, you can create a signature by selecting Options from the Tools menu. Next, when the dialog box opens, select the Signatures tab, click New, and then type the complete text for your signature in the Edit Signature field. Then, to include your signature on all outgoing messages, click the checkbox next to Add Signature To All Outgoing Messages, and click OK. If you decide to leave this box unchecked, you'll have to manually insert the signature into each message. To do this, place your cursor in the message body where you want to insert your signature, then select Signature from the Insert menu, choose your signature entry, and when it appears in the message body, you can click Send.

✓ In Outlook Express, even when you select All Headers from the View menu, you still won't see them all. When you need to take a closer look at the headers, especially if you're trying to find out where spam or harassing E-mail is coming from, open the message window and select Properties from the File menu. Then click the Details tab so that *all* of the message headers are now displayed. By closely examining the "Received" headers, you should be able to trace the path of an E-mail message back to its source.

Microsoft Excel

✓ In Microsoft Excel, you don't have to use the Function Wizard every time you want to perform an operation if you already know
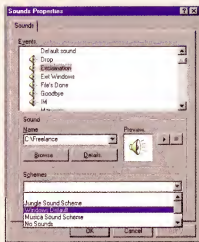
Help Someone Be As Productive As You Are

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Simply detach this RISK-FREE subscription card and PASS IT ALONG to your favorite fellow computer user!

Smart Computing also makes the perfect gift for those hard-to-buy-for co-workers, relatives, and friends.

Smart Computing gift subscriptions deliver months of easy-to-understand, hands-on computing information right to their doors.

IN PLAIN ENGLISH!

the name of the function. Some functions are fairly straightforward, such as SUM and AVERAGE. In the cell in which you'd like the function, type an equal sign, then the function name, followed by an open parenthesis: = SUM (. Click the first cell to use it and then hold down the CTRL key to select more cells. When you're done, type a close parenthesis, like), and press ENTER. For math functions, such as * or /, again type an equal sign (=), then click the first cell, type the function (* or /), click the second cell, and press ENTER.

✓ Microsoft Excel provides default fill lists that allow you to quickly enter regular information, such as the days of the week. You can also create your own custom fill lists. Simply highlight the information you want to use to create the custom list and click Options from the Tools menu. Then, click the Import button and OK. To use AutoFill, retype the information from the first cell, click the fill handle in the currently selected cell, and drag it across. Excel will automatically fill in the information for you.

Netscape Messenger

✓ If you're a Netscape Messenger user (versions 4.0 or 4.5), you can easily send a Web page via an E-mail message. Begin by opening the Web page you want to send, then right-click any blank area in the browser window. When the pop-up menu appears, select Send Page and a new

message window displays on-screen with the title of the Web page. Enter the recipient's E-mail address in the To field, add more text in the message body if you want, and click Send.

✓ Netscape Messenger (versions 4.0 or 4.5) allows
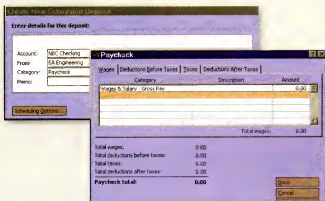
Microsoft Money simplifies the process of tracking your income, paychecks, insurance benefits, tax deductions, and retirement plan.

you to send encrypted E-mail messages so that no one else—other than the recipient—can read them. That is, of course, as long as the recipient has a security certificate. First, open a new E-mail message window and prepare your message. Next, if you have Communicator 4.0, select Options from the View menu, and then click the Encrypted checkbox. (You can also select a priority setting at this time.) Or, if you have Communicator 4.5, click the Security icon (the padlock) on the Message toolbar, and the resulting message will appear on-screen to tell you whether the recipient has a security certificate and how to include your own security certificate.

Microsoft Money

✓ Both versions of Microsoft Money (98 and 99) allow users to automatically enter their paychecks into the program. For Money 98 users, go to the Bill Calendar and select the New Bill button. Select Deposit and choose the

account that your paycheck will be deposited into, as well as the name of your employer. Then, select Paycheck under Category. A new window appears, letting you enter the amount, the date, tax deductions, deductions before taxes (for insurance and retirement plans), and deductions after taxes. Enter all of these amounts into categories for tracking purposes. In addition, be sure to select how often you receive your paycheck. For Money 99 users, select Set Up Bills & Deposits, click Schedule Paychecks & Deposits, and then click the New button. Money 99 opens a wizard that prompts you to select Deposit, enter how often you get paid (monthly,

weekly, etc.), indicate if it's a manual or direct deposit, and specify if the amount is the same every payday. Next, set up which account the deposit is made to and choose the Paycheck category. The Paycheck Wizard helps you set up all your deductions for retirement and taxes. After completing all the required steps, click the Finish button.

✓ You can use Microsoft Money to set up simple reminders or make regular transfers with the Bill Calendar. In Money 98, enter the Bills section and click the New Bill button. In Money 99, select the Bills area, and then wait for Microsoft's introduction to this section or jump directly to Set Up Bills & Deposits. Next, enter a bill, make a transfer, create a deposit, or make an investment. Then choose which account the money will come out of, type in whom you want to pay, what category it fits under, the date it's due, and amount. You can also choose whether you want to enter the transaction in the register or have Money do it. The bill appears as a little envelope on your Bill Calendar and displays in your opening screen 10 days before it is due. To alter the number of days Money warns you in advance when bills are due, select Options from the Tools menu and click the Bills tab. Here, you can set the specific number of days you want to be warned in advance and, if you wish, instruct Money to count only business days. ■

Figuring Out FTP

Transfer Files On The Internet Like A Pro

IF YOU SUFFER THE PC USER'S chronic malady, acronym-o-phobia, you might have avoided reading about File Transfer Protocol (FTP), much less using it. But if you've been surfing the Web for even a short amount of time you may well have already employed FTP—without even knowing it.

FTP is a technical convention for sending bits and bytes from one computer to another over a network. In other words, FTP is a standard method for transferring files over the Internet.

FTP may be an Internet standard, but to the uninitiated it can sound intimidating when someone uses the acronym as a verb. You may hear someone ask, "Can I FTP that file to you?" Just remember that in plain English FTP basically means sending files from one computer to another. In lingo you already understand, it's uploading and downloading. To be productive on the Web you'll be using FTP, so it pays to better understand how it works and why it is so important.

The Usual Uses

Many software companies distribute their wares via FTP because it saves them from having to press CD-ROMs. Software companies also make available fixes and upgrades to their products using FTP, which is especially handy for upgrading your Web browser. FTP upgrades are also convenient for antivirus programs, which require frequent updates to keep pace with the creation of new viruses.

Businesses such as publishers and print houses frequently use FTP for swapping files. Instead of copying huge page-layout and graphics files to removable storage media and sending them by courier, publishers can simply send their files to a designated Internet server. Downloading files from a server is also easier for the printer, who doesn't have to track piles of miscellaneous discs from customers.

Other FTP users are hobbyists who like to share information. Internet-savvy interest groups often upload and download files to an FTP server where fellow enthusiasts can poke through them. It might be computer

geeks trading software, genealogy buffs sharing family trees, or gardeners showing off photographs of prize-winning petunias.
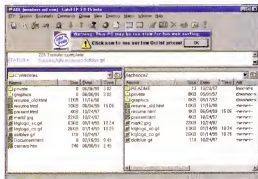
FTP Servers

FTP servers are computers on the Internet—sometimes called host computers—that let remote users connect for the purpose of retrieving or depositing files. While it is technically possible for regular folks to turn a home computer into an FTP server, we don't recommend doing this for kicks. Because remote users can potentially modify an FTP server's hard drive, this enterprise requires a good understanding of computer network security.

FTP vs. HTTP

Not all Internet computers that distribute files are FTP servers. Some Internet computers distribute files using the Hypertext Transfer Protocol (HTTP). When downloading files with your browser, you can determine the protocol by looking at the server name. If you
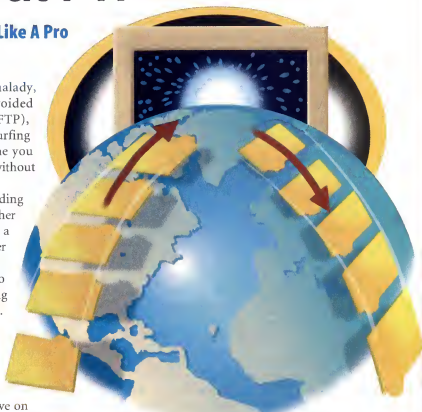
Like most graphical FTP programs, CuteFTP displays your hard drive files on the left and server files on the right.

see the prefix ftp, then it's an FTP server. If it says http, then it's an HTTP server. So what's the difference? Because browsers support both protocols, for users there basically is none.

In fact, if all you do is download files from public Internet servers (sites that are open to anyone), you may not need an FTP program. Well-known public servers include CNET (http://www.cnet.com), which has a huge general selection of software, and TUCOWS (http://www.tucows.com), which offers a collection of Internet-related programs. At these sites you use your Web browser to connect, find software, and click to download.

FTP Clients

If you wish to visit exclusive FTP servers, you'll benefit from using an FTP software program, sometimes called an FTP client. The reason is the interface. The best FTP utilities have two windows, one for the local hard drive (your computer) and one for the remote hard drive (the server). This design allows you to drag and drop files across the Internet almost as easily as you manipulate files within your Windows Explorer.

Accessing exclusive FTP servers can be tricky. Some only let users with accounts place and fetch files. In these cases you need to enter the server's address, a user name, a password, and sometimes even specify a particular directory. Other FTP servers, called anonymous FTPs, let anyone connect,

but they still require you to type in a dummy password.

The Web's Way

Another common reason to use a dedicated FTP program is for uploading Web pages and graphics to a Web server. Internet service providers (ISPs) commonly give users access to a personal directory on the server. To connect (or log on), you'll get a user name and password. Some ISPs even provide the FTP software.

Here's how it works. Use the FTP utility to connect to your personal folder on the server, locate the HTML file you want to edit there, and drag the file to your hard drive. After you've updated the file, simply drag the updated version back to its proper folder on the Web server.

If this sounds too simple, you're right. It is very easy to make mistakes when moving files from one computer to another. It's not uncommon for both new and experienced FTP users to drop files into the wrong folders, to confuse different versions of files, and worst of all, to copy an old version of a file over a new one, irreversibly deleting it. It's enough to make anyone nervous.

Nevertheless, FTP is the most reliable way to transfer files. FTP programs have features to automatically reconnect and resume the download if

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Downloading Files With Your Browser

When downloading a file with your browser, you'll use either the File Transfer Protocol (FTP) or the Hypertext Transfer Protocol (HTTP). The host where the file resides determines the exact method. Although users don't really need to worry about it, the process can still be confusing. Here's a guide to trouble-free downloads.

1. Before downloading a file, create a directory on your hard drive and call it TEMP. Save all your downloads here.

2. If your browser asks whether you'd like to run the program or save it, select Save To Disk. Direct the browser to your TEMP directory.

3. Next you'll see a small status window telling you the name of

the file you're downloading and the name of the host server. You may also see the number of minutes or kilobytes (KB) left in the download. You may see the percentage

Netscape Communicator's download status window.

of the job that's complete. But these lines can be misleading, and sometimes there are no readings. However, you should see a transfer rate, the number of kilobytes per second (KBps) being transferred to your hard drive. Depending on modem speed and Internet traffic, transfer rates average two to 10Kbps. If you do not see

the transfer rate numbers changing, the download may be doomed.

If the transfer rate appears to stop for more than five minutes, you may have lost the connection. When the transfer rate is too slow, the server thinks you've quit on your own, so it disconnects you. This is called timing out. Usually you can recover by returning to the Web site and trying again.

4. Once the download is complete, you can install your new program. Close all other open programs, double-click on the downloaded file and follow the instructions that appear.

5. Once you've started using your new program, you can delete the downloaded version from your TEMP file on your hard drive. ∎

a connection is broken. Furthermore, they can automate file transfers, move entire directories at once, and search for specific files.

Today's FTP programs emulate the Windows file manager interface we're all familiar with, so they are simple to learn. They're also very inexpensive, ranging from free evaluation copies to $40 for the full versions.

Popular Packages

There are many FTP programs available on the Internet. On a recent trip to the TUCOWS Web site we found no less than 127 software packages that include an FTP utility. Each listing on TUCOWS includes a rating, a price tag, and a download button.

Two of the most popular, highly rated FTP packages are WS_FTP from Ipswitch Inc. and CuteFTP from GlobalSCAPE Inc.

CuteFTP. We downloaded an evaluation version of CuteFTP 3.0 and were impressed. Banner ads appear in the trial version, but if you purchase the program the banners will disappear.

We used the connection wizard to set up a connection to our Web server. (As we mentioned earlier, you do have to know vital facts such as the address of your server and your user name and password.) CuteFTP provides many preset sites to explore and there is something to interest everyone, from programmers to hobbyists. CuteFTP lets you set up as many FTP sites as you wish and even lets you import site specifications from other FTP programs.

Once connected, we found the interface familiar. Hard drive files appear on the left and server files appear on the right. Moving files from one computer to the other amounts to a simple drag and drop. Even better, when we tried to copy a file with the same name from hard drive to server, CuteFTP displayed a warning. We liked that.

CuteFTP has a nifty search mechanism that lets you search for MP3 (compressed music files) or other files on the Internet. Just type in a song, group, or other keyword, and it will query five search engines for you. Successful searches get a list of matching files complete with server names, paths to files, file size, and even a password if necessary. Because many MP3 servers require you to first give a file before you can take one, we had trouble downloading some files; nevertheless, it's a handy Internet search tool.

One more interesting feature of Cute FTP is its HTML editing software, CuteHTML. This little program has a clean interface and automated features that experienced HTML authors will like. But if you prefer Web editing without using HTML codes, then CuteHTML may not be for you.
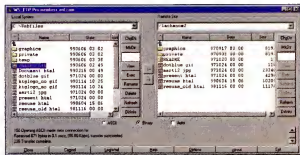
WS_FTP's "classic" interface has separate file management menus for hard drive and server files.

WS_FTP Pro. We also tried an evaluation copy of WS_FTP Pro 6.0. We liked it too, but for different reasons.

This program's Windows Explorer interface lets you use FTP right from your desktop. Simply open the Explorer from the Start menu, go to the WS_FTP folder, click on the WS_FTP Explorer folder, and you'll see a list of pre-set FTP sites. Double-click to connect. Then click Add and a wizard will help you add your own sites to the list.

We were a little confused to see the WS_FTP Pro Explorer icon also on our desktop. Although clicking on it opens a new Explorer window, it

doesn't have the left- and right-hand panes that make moving files from one directory to another so easy.

WS_FTP also has a "classic," two-window interface. Don't let the Courier font put you off! This interface has a refreshingly small number of menu items to choose from. To log on, click Connect. You'll get a window with a list of sites. You can also add new sites from here. To end the connection, click Close. It's very simple.

WS_FTP also includes a search function that lets you look up specific files on FTP servers. This is a feature expert users will appreciate.

No matter which interface you use, you should enjoy WS_FTP's distinctive sound effects, including a train whistle for a completed task.

FTP For The Masses

Even acronym-o-phobes will admit that FTP utility software belongs in every Web-user's toolbar. For the most flexibility in sending files over the Internet, these handy utilities can't be beat. Use FTP to connect to your Web server, to download a fix for a software program, or to find the latest information about your family tree. Now the next time you're called upon to "FTP a file to the server," you'll be as prepared as anyone. ▮

by Marti LaChance

Movin' On Up

**How To Select & Install
The Right Edition Of Office 2000**

IF YOU ARE READY to rev up your version of Microsoft Office, then you are ready for Microsoft's latest and greatest desktop application suite: Office 2000. Its tight Web integration, top-notch collaboration tools, and improved Help system are enough to make any Office fan rush to the store to grab a copy.

When you get to the store, however, confusion may strike. There are actually five editions of Office 2000, and each version has a different mix of programs. In addition, you will probably want to make sure you really need to upgrade to the new edition and that your system can handle the upgrade.

What You'll Gain

Before you lay down hundreds of smackers for a productivity suite, you probably need to convince yourself that you are not spending money recklessly. Make sure you *really* need the new features in the latest edition of Office.

Some of the major improvements for the suite include Web integration (the ability for the programs to work hand-in-hand with the Web) and collaborative tools that help you work more effectively. The software also (practically) installs and supports itself—a real help for overworked information technology (IT) departments or even everyday users who don't want to fool with a messy installation. Furthermore, you can easily customize the Office 2000 programs to fit your needs. For example, Office lets you individualize the pull-down menu commands to include just those you use most frequently. (It quietly drops the rest of the commands off the menus.) Microsoft has also revved up the Help system. It includes new ways to use the Office Assistant and quick methods for getting help on the Web. Finally, each individual program includes new features designed to help personal productivity.

But don't take our word about the value of the new features, do a bit of research on the Web for yourself. To take a tour of the new features, go to Multimedia Demos portion of the Office section on the Microsoft Web site (http://www.microsoft.com/office/features/default.htm). If you're using a previous version of Office, you can see how it compares to Office 2000 at the What's New For You (http://www.microsoft.com/office/upgradecomparison/default.htm) portion of the Office section. (For a more complete overview of the new features, see "Office 2000: The Package" and "Office 2000: The Parts" in the April 1999 issue of *Smart Computing*.)

Different Strokes For Different Folks

If these new features entice you into upgrading, your next step is to determine which Office 2000 edition best fits your needs. To take care of the wide variety of needs among users, Microsoft packages the Office 2000 Suite in five ways. While all flavors of the suite include Word, Excel, and Outlook, the balance of programs differ depending on the intended market. For example, the Developer Edition includes Developer's Tools—something most users won't need.

If you're like many users, the Standard Edition will more than satisfy your needs. It includes Word, Excel, Outlook, PowerPoint, and Internet Explorer. The Small Business Edition includes the same software, but swaps PowerPoint for Publisher. The Small Business Edition also includes business software, such as Small Business Financial Manager, Direct Mail Manager, and Business Planner—all designed to help entrepreneurs. The Professional Edition packages all the software used in the Standard and Small Business versions, but also adds Office's heavyweight database,

Access. If you want to raise the bar a bit higher, you can step up to the Premium Edition, which includes all the applications already mentioned as well as Web-creation software (FrontPage and PhotoDraw). Finally, you can purchase the Developer Edition, which includes all the software from the other editions as well as the Developer's Tools.

Of course, the retail price of each edition also fluctuates depending on which software is in the edition. For a quick overview of the components and cost for each edition, take a look at "Office 2000 Prices & Features."

If you still don't know which edition is your best option, try Microsoft's online survey at http://www.microsoft.com/office/order/selector.htm to find the right mix of programs for your needs. Just choose either the Yes or No radio button for each of the questions on the short survey, then click Submit. Microsoft analyzes the type of work you perform and then recommends the best version of the suite for you.

Check Your Hardware

OK, so you have picked the edition of the suite you feel is best for the work you perform. Before you get too excited about buying the product, however, it's wise to find out if you have a system capable of running that version of the Office suite.

First, don't plan to use your old 486 machine to run Office 2000—the system will probably grind to a halt! In fact, you will need a PC with at least a 75 megahertz (MHz) Pentium processor. If you plan to use PhotoDraw, you will need the boost of at least a 166MHz processor. You'll also need ample room in memory to run the programs. Microsoft recommends you start with 16 megabytes (MB) of RAM for Windows 95/98 (32MB for Windows NT workstations), and then

add 4MB RAM for each program you run concurrently. In fact, some of the memory-hungry programs eat up even more memory. Plan on having 8MB for Access, Outlook, or Front Page and 16MB for PhotoDraw. You'll also need a CD-ROM drive to install the software.

The Standard Edition's hard drive requirements are scanty when compared to the other versions. Even so, you need 189MB to use the basic features for the Typical installation. If you plan to use the Premium or Professional Editions, you'll need to soup up your system accordingly. For example, the Premium Edition eats up 252MB of hard drive space for the Typical installation of Word, Excel, Outlook, PowerPoint and Access, but needs an additional 274MB to run Publisher, PhotoDraw, and the small business tools. If you're hungry for more features or want the Office graphics on your hard drive, remember these features can easily eat up even more drive space. Finally, plan on keeping approximately 10% of your hard drive space free—so avoid cramming your entire drive full of files.
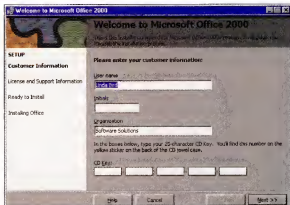
Microsoft Office 2000's Installation Wizard guides you through the setup process step-by-step.

To find out the exact system requirements for each of the Office editions, check out Microsoft's Office 2000 Systems Requirements page at http://www.microsoft.com/office/features/ofc2000tour/Sysreqs.htm.

Prepare To Install

Once you know you have enough power and space on your system to run Office 2000, you can begin laying the foundation for a seamless installation (and a smooth recovery if things go badly).

First, scan for viruses using your antivirus software, keeping in mind that many viruses aren't evident until you change something on your system (such as adding or upgrading software). When you finish, disable your virus-protection software to keep it from interfering with the Office 2000 setup program.

Of course, backing up all your data files is a necessity. Even though it's unlikely your hard drive will experience a meltdown during installation, the extra security of having important files in another location is well worth the effort it takes to back them up. It's also wise to create system diskettes so you can recover Windows if things go awry. As a final step before installation, make sure to close all open programs.

Installing Office 2000

Now you're ready to actually perform the installation. The Installation Wizard will guide you through the process. First, click the Start button, choose Settings, and then select Control Panel. Double-click the Add/Remove Programs icon to display the Add/Remove Programs Properties dialog box. Click the Install button, pop CD number one into the computer's CD-ROM drive, and then click Next so Windows can locate the correct setup file (Setup.exe) on the CD-ROM. Click Finish in the Run Installation Program dialog box to start the Installation Wizard.

Eventually, the Welcome To Microsoft Office 2000 dialog box displays so you can enter your customer information and the CD-Key number. Type in

all the required information before clicking Next.

Click the Option button to accept the license agreement, then click Next. The wizard will then present you with a choice. You can either accept the Typical installation (the preprogrammed choices Microsoft thinks most users want) or choose Customize so you can tweak your system to your exact needs. For example, if you customize the system, you can specify which features to install and where to locate the program.

For most users, it is best to start with the Typical (default) installation because you can always customize Office later. To do this, click Install Now. The Installation Wizard will then verify the installation tasks. If necessary, clear any message boxes that display.

Now you can relax with a cup of coffee and watch the Installation Wizard load files onto your system. Keep an eye on the wizard's progress by watching the dialog box that displays during installation.

When the installation process is complete, you will see a message that asks you to restart your system. Click Yes to reboot your computer, then wait a few minutes as Windows sets up files (and reboots the system again) so Office 2000 can run correctly. When you see the Finishing Microsoft Office 2000 Setup dialog box, you know the installation is almost complete. If you want, it also lets you create a startup diskette for Windows.

Customizations & Modifications

Congratulations! You have successfully installed Office 2000. If you relied on the Typical installation to get

You can customize the look and feel of your Office 2000 programs whenever you want.

Office on your computer, chances are good that you'll eventually want to tweak your setup a bit. For example, you might want to choose the location for the files (such as the CD or your hard drive) or install additional features.

To make modifications to Office 2000's configuration, redisplay the Add/Remove Programs Properties dialog box. On the Install/Uninstall page, choose Microsoft Office 2000, then click Add/Remove. Choose Add Or Remove Features, which allows you to modify which features are installed and how they should operate. Expand the list of features associated with a program, such as Word, by clicking the software's plus sign (+). The features associated with each program are listed with an icon representing the location of the feature. Click the drop-down list arrow for the feature you want to install, modify, or remove, then choose the options you want on the drop-down list. For example, you can choose Installed On First Use to indicate that Office should only install the feature if a user activates the associated command. After making your selections, choose Update Now. If the new setup configuration is successful, a message box will inform you of the good news. Click OK to clear the box.

Install On First Use

After you install Office 2000, you would think you would have instant access to all its features, but you don't. To save space on your hard (or network drive), Office doesn't install every Office 2000 feature included on the CDs. For example, many features in the suite, such as templates and clip art, aren't installed until a user accesses them for

the first time. This prevents you from cluttering up your hard drive with features you'll never use.

If you have a feature set up to install on first use, then a message box indicating the feature is not installed will appear the first time you try to use that feature. Click Yes to install it. Also make sure to have your Office CDs handy; you'll probably receive a prompt asking you to insert at least one of them into the CD-ROM drive. Remember, you only have to go through this procedure once. After you initially install a feature, it'll be available for future work sessions.

The Changing Face Of Office 2000

So you've installed and customized the suite without a hitch. What can you expect from the new programs? While most of the elements in the Word and Excel application windows appear similar to those in previous versions, the Standard and Formatting toolbars share one row to save space. To use buttons that don't display, click the More Buttons button (represented by the double-right arrows) at the right end of each toolbar. Choose a button on the pallet to add the button to the toolbar's display and execute the command.

If you don't like the all-in-one toolbar setup, here's how to change it: Choose the Tools menu and select the Customize command. Then, click the Options tab. Clear the check box for Standard And Formatting Toolbars Share One Row. Close the Customize dialog box and you're ready to roll.

You can also customize how the Office Assistant operates. To temporarily turn off the feature's display, right-click the Assistant and choose Hide. To permanently turn off its display, choose Options from the Assistant's shortcut menu to show the Office Assistant dialog box. On the Options tab, uncheck the Use The Office Assistant box and then click OK.

Another great feature of Office 2000 is its ability to individualize the menus and toolbars to reflect what

you use most often. To do this, Office keeps a running list of the commands you use, called usage data, and then automatically adjusts the menu commands. Over time, Office drops off the less frequently used commands from the pull-down menus. If you ever want to revert back to the original commands, you can restore the default settings in a flash. Open the Tools menu and select Customize. Then, click the Options tab. Click the Reset My Usage Data button and choose Yes to confirm your action. Finally, clear the Menus Show Recently Used Commands First box before closing the dialog box.

File Compatibility

You are probably also wondering how well the Office 2000 programs can handle files from previous versions of Office. The 2000 programs have complete support for features used in the earlier versions and can handle files that use a variety of

formats. Just open any Office file in a 2000 program and then choose to save it using the original file format or as a 2000 file. Just open the File menu, select the Save As command, and then click the Save As Type drop-down list arrow. Choose the format you want from the list and click Save.

Trouble In Paradise?

Finally, if you've ever struggled to keep software up and running, but couldn't diagnose the problem, you will be happy to know Office 2000 includes a self-repairing feature in all its applications. These applications can automatically diagnose and cure any ills created by missing or corrupted files. Because the programs repair themselves, you don't have to waste valuable time trying to figure out how to correct problems in your applications. Keep in mind that this feature mainly detects and repairs errors within the Office programs themselves

(such as missing files or registry settings); it doesn't correct problems with documents you create using the programs.

The self-repairing feature works in two ways: If you want to fix files that aren't critical to running the application, such as fonts and templates, then select the Detect And Repair command from the Help menu. Have your original CD-ROMs ready because Office may need to reload files from them. On the other hand, Office automatically detects and fixes problems with mission-critical files (those needed to run the software) whenever you launch the Office program.

If all else fails, read the directions. You can view a wealth of information about installing and managing Office 2000 by accessing Microsoft's Office 2000 Resource Kit at http://www.microsoft.com/Office/ORK/2000. Then go to work enjoying and using your new software. ∎

by Linda Bird

Office 2000 Prices & Features

Software Included		Standard Edition	Small Business Edition	Professional Edition	Premium Edition	Developer Edition
Software Included	Word	✔	✔	✔	✔	✔
	Excel	✔	✔	✔	✔	✔
	Outlook	✔	✔	✔	✔	✔
	PowerPoint	✔		✔	✔	✔
	Internet Explorer 5.0	✔	✔	✔	✔	✔
	Small Business Financial Manager		✔	✔	✔	✔
	Publisher		✔	✔	✔	✔
	Direct Mail Manager		✔	✔	✔	✔
	Business Planner		✔		✔	✔
	Access			✔	✔	✔
	FrontPage				✔	✔
	PhotoDraw				✔	✔
	Developer's Tools (VBA)					✔
Estimated Retail Prices	New User Price	$499	$499	$599	$799	$999
	Upgrade Price	$249	$249	$349	$449	$649

Microsoft Office 2000 Editions (header spanning the edition columns)

Portable PCs

All The Amenities For Less Than $2,000

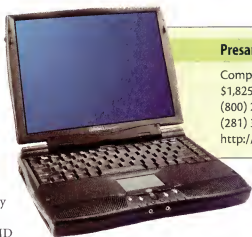**Presario 1670**

Compaq Computer Corp.
$1,825
(800) 282-6672
(281) 370-6710
http://www.compaq.com

The 1670 is one of Compaq Computer Corp.'s latest additions to its popular Presario line of notebook PCs. It features one of Advanced Micro Devices' (AMD's) newest mobile processors and several features that enhance users' Internet experience by making Web navigation simpler and more intuitive.

Compaq has taken advantage of a new line of AMD processors in its new Presario 1670. It comes with a 350 megahertz (MHz) K6-2 processor and 64 megabytes (MB) of standard Synchronous Dynamic RAM (SDRAM). Users can expand the notebook's memory to a hearty 192MB. It also features a decent-sized 4.3 gigabyte (GB) hard drive, an integrated Fujitsu 24X CD-ROM drive, an integrated 1.44MB diskette drive, and an internal Lucent 56 kilobits per second (Kbps)/V.90 modem. Compaq stuffs all this equipment into a case that is 12.2 inches wide x 10.8 inches deep x 1.97 inches high and weighs in at 7.5 pounds. This isn't light, but it isn't excessively hefty for a notebook featuring full integration of its components. An impressive 13.3-inch thin-film transistor (TFT) active-matrix display driven by a Rage LT Pro AGP video chipset with 8MB video memory tops it all off.

The construction of Compaq's notebooks nearly always seems to be good, and the 1670 continues this tradition nicely. With a solid double-latch lid that isn't very flexible (which translates into little image distortion and bodes well in terms of durability) and trusty hinges that will faithfully hold the display in your favorite position, the 1670's case is sturdy and ready to travel. The unit's JBL Pro speakers are also outstanding. With all the notebooks we have seen to date, these speakers produce the most volume with the least distortion. They produce the sound both from their grilles atop the wrist rests (which, by the way, are slightly rounded and surprisingly comfortable) and from vents on the front edge of the unit.

The only area where the design of the 1670 fell short was its keyboard, an area in which Compaq usually excels. While the 1670's keyboard seems fairly spacious, it features tiny HOME, END, and other cursor-related keys that are just to the right of the BACKSPACE, ENTER, and SHIFT keys. This caused a bit of confusion as we began to type, but we became more accustomed to this layout after a little practice. We did, however, like its other input device: a touchpad. Just below the touchpad's buttons we found a two-way scrolling button like those found on

some mice. This button lets you scroll through Web pages, large Windows, and other big documents with ease, and is nicely complemented by the four Internet shortcut buttons placed below it. These buttons launch your Internet browser, allow you to run quick searches, give you access to secure E-commerce functions, and take you to your E-mail with just a touch.

The performance benchmark scores turned in by the 1670 weren't amazing. They were, however, better than the scores we have received from other notebooks with K6-2 processors. Plus, the scores were appropriate for a notebook priced at less than $2,000. It yielded a score of 111 in Office Productivity, a 110 in Content Creation, and a 111 overall score, compared to the wimpy 86 overall score turned in by another Compaq with a 333MHz K6-2 in March of 1999. The 1670 was below average, however, in battery life scores. While running the SYSmark for Battery Life 98 test, it had an elapsed time of 2:08:46 and completed 1.5 loops.

The major problems we had with the 1670 were its poor battery life scores and its somewhat cramped keyboard. These shortcomings, however, are easier to overlook when you consider the unit's excellent multimedia capabilities, sturdy but comfortable design, smart Internet functionality, and its rather modest price, only $1,825. ∎

by Chris Trumble

This Month's Reviews

Too Skimpy On Storage

MPEG 3 (MP3) has caused a music revolution on the Internet and Diamond Multimedia is taking that revolution to the streets with its Rio PMP 300. The Rio allows you to take near CD-quality MP3 music files with you wherever you go and enjoy them in stereo sound.

The Rio is about the same size and weight as a pager. It allows users to transfer MP3 files to the unit's onboard RAM via a parallel cable connection. The unit uses Solid State Technology to hold and playback music. The device holds and reads information entirely from RAM. Go

> **Rio PMP 300**
>
> $169.95
> Diamond Multimedia
> (800) 468-5846
> (541) 967-2450
> http://www.diamondmm.com

ahead, shake it and drop it; the music won't skip like it would if you were playing it from a CD player.

A Menu, Equalizer, and Intro button along the top give easy access to important features. The equalizer

comes with presets for a wide variety of music, including Rock and Jazz. The Intro button plays the first 10 seconds of a song before moving on to the next one. The front of the device contains all the vital controls including Play, Stop, Volume, and Random buttons.

The Rio also comes with an impressive array of MP3 software for the desktop. MusicMatch allows users to create MP3 files from their own CD selection and Rio Manager allows you to manage and transfer your MP3 files between the Rio and your computer.

In the time it took to play a CD, MusicMatch had compressed each song into a high quality MP3 file. Of the 13 songs on our 45-minute CD, only eight songs transferred to the Rio's 32MB of RAM, which translated to a little more than a half-hour of music.

Diamond recently dropped the price on the 32MB Rio to $169. Even with the latest price drop, we recommend waiting until prices come down and storage capacity increases. This is simply too much to pay for only 40 minutes of audio. **▌▌**

by Chad Denton

Lapping The Competition

Usually inkjet printers that cost $100 or less aren't worth the paper they use to print. They're so slow and their print quality is so poor that they are hardly suitable for printing letters. Usually, however, doesn't mean always.

If you insist on spending no more than $100 for a printer, the Lexmark Z11 is the way to go. With speeds up to five times faster than the $100 Hewlett-Packard Deskjet 420C on our plaintext test, and about 30% faster on two of the three other speed tests, the Z11 runs laps around its main competitor.

Like other printers in this price range, the Z11 can hold only one ink cartridge at a time. This is a serious disadvantage against some slightly more expensive printers that can hold two. Those printers that can hold both the color and black cartridges don't have to combine colors to make

black ink. If you print a document with *any* color in it in single-cartridge printers, then you'll have to use the color cartridge even for the black ink. The printer will form the black ink by combining all the colors together. This uses a lot of ink and often produces brown or blue tinted "black" text.

That wasn't the case with this printer. Text was a little fuzzy but the ink did look black. Of course, it still uses a lot of ink. For a $99 printer, the Z11's color reproduction and speed were remarkable. Its photo reproduction was

better than some more expensive printers, and it did a good job of printing photos on less-expensive plain paper, too.

The Z11's speed is excellent: Its time on our plaintext test is actually the best among all the printers we've tested that cost less than $150. The Z11's time on the other three tests were also well above average in the sub-$150 range.

The Z11's zippy speed and average print quality make it a good bargain at $99. Especially when you consider that not all printers priced less than $150 offer that—let alone those that cost less than $100. **▌▌**

by John Lalande

> **Lexmark Z11**
>
> $99
> Lexmark International Inc.
> (888) 539-6275
> (606) 232-2000
> http://www
> .lexmark.com

An Almost Flawless View

The 17-inch ViewSonic E771 monitor skunked us in almost all our efforts to find problems with it. Lines were ruler-straight, images appeared defined, and text displayed itself in bold lettering. When we noticed the slightest distortion, the on-screen display (OSD) controls allowed us to fix it.

We did, however, find a downfall. It occurred when we changed the screen images. The entire viewable screen jumps to accommodate a new brightness.

Also, when we increased the resolution to 1280 x 1024 pixels on the screen, we had to decrease the refresh rate

from 85 hertz (Hz) to 60Hz. This made the higher resolution almost useless because the slow refresh rate caused major flickering. To avoid this problem, we kept the monitor at 1,024 x 768 pixels at 85Hz.

At the 1024 x 768 resolution, we enjoyed deep, rich colors. The colors appear extremely bright, which helps to give the images depth. Despite the monitor's wide **dot pitch** (distance between pixels) of .27mm, its great contrast helps define graphic images. The graphics look almost three-dimensional.

Text also appears distinct. With letters made of

undistorted lines and angles, we could easily read fonts. Borders and grids spread across the screen in parallel and even regularity.

We noticed some wavy moiré patterns, but the OSD controls fixed that problem. The OSD buttons are located beneath the screen and offer a spectrum of options to alter the on-screen image.

In addition, ViewSonic offers the latest in flat-screen

technology. This minimizes distortion caused by a curved screen. ViewSonic coats it with an anti-static, anti-glare treatment to further minimize vision inhibitors.

The monitor costs $279 and comes with a limited three-year warranty. You can find 17-inch monitors for less cash, but you may sacrifice impeccable text and colorful images. **II**

by Michelle Nelson

Bring The Theater Home

Digital Video Disc (DVD) technology is designed to take audio and video to new heights, and it does. The quality of audio and video in DVD is beyond compare. With Creative Labs' PC-DVD Encore 6X DVD kit, it is extremely simple to get big-screen multimedia performance from your PC.

This kit has everything you need. It includes the Enhanced Integrated Drive Electronics (EIDE) DVD drive and the decoder card so you can watch DVD movies on your computer. Creative Labs also throws in three solid DVD titles: Riven, Compton's Encyclopedia,

and National Geographic: The 90s.

The PC-DVD Encore works with Windows 95/98. It reads most optical drive formats, including audio CD, CD-ROM, CD-recordable, CD- rewriteable, Photo CD, Video CD, DVD-recordable, and DVD Video.

We installed the PC-DVD Encore on a 300 megahertz (MHz) Pentium II computer with 64 megabytes (MB) of RAM, running Win98. We didn't run into any technical problems when we installed the drive or software.

We then ran our performance tests. This DVD drive has an average data

transfer rate of 6,051 kilobytes per second (KBps) for a DVD drive rating of 4.5X. That data transfer rate is roughly equivalent to a 40X CD-ROM drive rating. In other words, it transfers a lot of DVD data in a hurry.

Next, we checked out the **random-access time** (average amount of time the drive needs to find a piece of data) and **full-stroke-access time**s (how long it takes to move from the innermost to the outermost track on a DVD). We clocked the random-access time at 133ms, which is pretty de-

cent, and the full-stroke-access time at about 293ms, which is slower than most optical drives. (We would like to see that number at 200ms or less.)

Overall, this is another fine product from Creative Labs. We love the high-quality video and sound that DVD delivers, and the PC-DVD Encore 6X didn't disappoint us. The price is fairly reasonable, and it comes with a nice collection of software. It's an all-around great kit. **II**

by Michael Sweet

Mighty Mouse

The GoldTouch Mouse is a great example of functional, ergonomic design. Invented by the husband and wife team that founded GoldTouch Industries, this mouse fits comfortably inside the hand. Like the majority of mice on the market today, the GoldTouch Mouse is PS/2 compatible and comes with a PS/2-to-serial adapter for users that need serial connectivity. The unit we reviewed came with a 1.44 megabyte (MB) diskette that contained driver software for use with DOS, Windows 3.x, and Windows 95. The Win95 drivers don't work with Windows 98, but Win98-compatible drivers are available at Gold-Touch Industries' Web site. GoldTouch will probably include the Win98 drivers with the mouse before long.

The GoldTouch Mouse has a unique scroll/pan button (just to the left of the standard buttons) that functions similarly to scrolling wheels found on many mice on the market. Clicking and holding it allows you to scroll up and down or left and right throughout windows, while using it in conjunction with your keyboard's CTRL button lets you zoom in and out between levels of magnification (a great function to have when using graphics programs). If you click and release the scroll/pan button, a circular scrolling icon appears.

When this icon is present, you can pan through-out a document in any direction without holding the scroll button. Moving the mouse a short distance in any direction causes a slow, gradual pan, while moving the mouse a longer distance pans through the document much faster. To exit panning mode, simply click any of the mouse's three buttons, and the icon will disappear.

First and foremost, though, the GoldTouch Mouse is designed for comfortable, ergonomic use. The GoldTouch Mouse is one of the most comfortable mice we've used, and it doesn't sacrifice one whit of usefulness to achieve this goal. Its price is also reasonable, and you can purchase it directly from Gold-Touch's Web site for $49.95. ▋

by Chris Trumble

GoldTouch Mouse

$49.95
GoldTouch Technologies Inc.
(800) 593-2453
(714) 798-0300
http://www.goldtouch.com

Grand Graphics

When you're ready for a serious, professional-use, color laser printer, step up to the network-ready Xerox DocuPrint NC60. It's a compact 89-pound model with a long list of desirable features.

Above all, the NC60 produces beautiful color graphics. Despite its standard 64 megabytes (MB) of RAM (maximum of 128MB), it took more than 16 minutes to print our Adobe Photoshop image file—but the results were stunning. The full-page 600 x 600 dots per inch (dpi)

image rendered as perfectly as the original looked on-screen, without banding, clipping, or washing out. Other color performance tests—a Microsoft Word text/graphics file and a PowerPoint presentation—benefited from similarly bold hues. Four-color speeds for these tests were 3.75 pages per minute (ppm) and 3.33ppm, respectively.

Text performance was bold and clean with a top speed of more than 11ppm. The NC60 is standard with 35 Adobe Type 1 fonts and can handle PostScript 3 and Printer Control Language (PCL) 5c page description languages. We clocked this Xerox at 11.1ppm in our 10-page text file test. Draft print quality was relatively good.

The underslung paper input tray has a 250-sheet capacity, and you have the option of adding another 250-sheet tray. The NC60 can digest pages up to 8.5 x 14 inches, in weights from 16 pounds to 24 pounds, and it can produce 20,000 prints per month (half in color). New toner cartridges cost a mere $18 for a black unit and $60 for each color cartridge (cyan, magenta, and yellow). Compared to the competition, this is extremely inexpensive.

This isn't, however, the simplest printer to set up. The toner cartridges are more like refill bottles, and you'll need to install a container of fuser oil. Fortunately, Xerox included clear, step-by-step instructions with good illustrations, which kept setup from being a nasty experience.

Xerox backs the Docu-Print NC60 with a one-year on-site limited warranty, and has declared it Year 2000-compliant. ▋

by Marty Sems

DocuPrint NC60

$2,695
Xerox
(800) 349-3769
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http://www.xerox.com

intel inside
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ThinkPad® 390 ●	$1,799 to $2,599*	mobile Pentium® w/MMX™ technology or Pentium II processor 233 to 266 mhz	3.2/4.3gb hard drive, 32/64mb memory, integrated floppy/cd, 12.1" or 14.1" TFT display, optional 10/100 EtherJet card		ThinkPad 390. The most affordable ThinkPad. All of the essentials, ready for company-wide distribution. www.ibm.com/thinkpad or 800 426 7255, ext. 5040

Video Cards

The Key To What You See Is In This Unseen Component
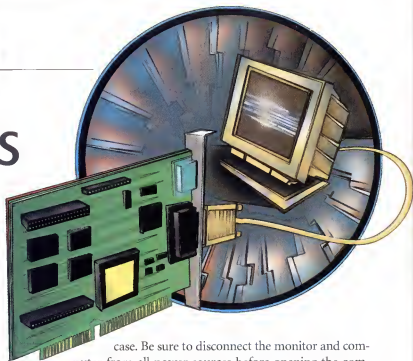
FOR A COMPUTER USER, the worst news possible occurs when the monitor goes blank or displays a string of error messages. But if your monitor could speak, it would probably say, "Don't blame the messenger!" Many problems related to the display may start somewhere else in your system, even though your monitor lets you know about the problems. Some of those problems originate with the video card.

A video card is a piece of hardware that controls the appearance of images and text on your PC's monitor. All data from the computer's microprocessor travels through the video card, which translates the signals and sends them to the monitor for display. Some video cards are expansion cards, while others are built into the **motherboard**, the PC's main circuit board. Video cards have several other names, including video controllers and video adapters. Some types of video cards, usually called graphics accelerators or video accelerators, contain additional chips that handle graphics computations, letting them work faster.

A correctly functioning display system requires three components to work—the video card, the monitor, and the video card **driver**, software that controls the card. Your display system can only be as powerful as the weakest link. If you have an ancient video card, using the newest monitor won't help your overall performance much. And a breakdown among any of the components will cause display problems, which you'll notice through the monitor. If you've determined the problem doesn't come from the monitor, try the following tips to get the video card working.

| Problem: I have no image on the monitor.
| Solution: First, make sure the monitor is working properly; monitor problems are easier to correct than video card problems. If you can't correct the problem through the monitor, try these video card tips. *(NOTE: If your display is malfunctioning and blank, try booting in Safe Mode as described in the sidebar.)*

• The video card's settings may be incorrect (see last section of this article).

• Make sure the cables that connect to the video card or video controller inside the computer are tightly connected. To check them, you'll need to open the computer

case. Be sure to disconnect the monitor and computer from all power sources before opening the computer case and ground yourself by touching some metal before reaching inside the case.

While the case is open, make sure the video card is seated tightly into the expansion card slot. You should only be able to see a small portion of the top of the gold contacts on the card's lower tab. Check the physical state of the video card. On older video cards, some of the chips occasionally work themselves loose from their sockets. If a chip is loose, gently push it back into its socket.

• Some monitors and video cards are incompatible. (This shouldn't be a problem unless you've changed the video card or monitor in your system after purchasing it.) If your display system is incompatible, you won't see any display, and you may hear some system beeps at startup that sound like error messages. Check your monitor and video card documentation to make sure the two are compatible. If you discover an incompatibility, you'll need to change one of the components, or you may be able to purchase a software or hardware patch that can correct the problem. Contact the manufacturers.

• If you recently added a video card, remove or disable the old video card (unless you're planning to use both cards). Some computers ship with video controllers built into the motherboard. The original controller will have to be disabled; check your PC's documentation or check with the PC's manufacturer for instructions.

• You may have a corrupted or incompatible display driver. See the next problem for some tips on drivers, and see this article's last section for information on changing your driver.

| Problem: I think my display driver is incompatible with my video card.
| Solution: If you've tried some of the other troubleshooting tips and can't seem to solve your display problem, you may have a driver problem. If you suspect the driver is corrupted, see the sidebar for booting in

Safe Mode (if needed) and check below for information on reinstalling the driver from diskette or from the Windows 98 or Windows 95 CD. If the display does not work in normal booting mode but works properly in Safe Mode, the problem is probably with your display driver.

An incompatible driver problem may occur if you've recently changed video cards or if you've upgraded from Windows 3.x to Win98 or Win95. If you're using an old Windows 3.x display driver under Win98 or Win95, you should upgrade as soon as possible because the older drivers don't support some Win98 and Win95 display features. Your new video card should ship with its own driver on diskett. You can install it using the techniques described below or in the video card's documentation.

You can check driver incompatibilities through the Control Panel in either Win98 or Win95. Double-click the System icon and then click the Device Manager tab. Under the Display Adapters icon, you'll see the current display driver. (Click the Display Adapters plus sign to see the available drivers.) If you see a yellow exclamation point over the driver's icon, the item is working incorrectly. Highlight the driver and click the Properties button to see its status. If you click the General tab in the selected driver's Properties window, Win98 or Win95 will show whether the driver is working in the Device Status section in the middle of the window. Click the Resources tab to see the conflict that exists. If you want to change the driver, click the Driver tab.

Problem: The images on my screen appear distorted (with a wavering, scrambled display and moving dots), the images appear as moving lines, and/or the text is unreadable.

Solution: If the problem isn't a monitor malfunction, try resetting the video card's settings. You especially
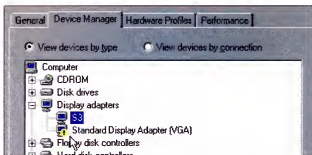
A yellow exclamation point over your display driver signals a malfunction or device conflict.

will want to adjust the video card's resolution and **refresh rate**, the number of times per second the screen is redrawn. Some higher resolutions can cause display problems.

Problem: My PC frequently locks up.
Solution: This problem can have many causes, but if your video card can't handle some of the graphics requests from Windows and other programs, it may lock up. You can change the way Win98 or Win95 uses your graphics hardware as a temporary solution to this problem.

In the Control Panel window, double-click the System icon. In the System Properties window, click the Performance tab. At the bottom of the window in the Advanced Settings section, click the Graphics button. In the Advanced Graphics Settings window, you'll see a slider bar and a pointer that signifies how Win98 or Win95 accelerates your graphics hardware. The right side of the slider bar is Full, for the most acceleration, while the left side is None, for no acceleration.

For PCs working well, use Full. If you're having difficulty seeing the cursor at times, drag the pointer one setting to the left of Full (called Most). This should make the cursor more visible, but you might notice a slight overall system performance dip (because of the lower graphics hardware acceleration).

If, however, you have frequent system lockups and program errors, try moving the pointer two settings to the left of Full (the Basic setting). Click OK, followed by the Close button. You'll

then need to click OK to restart the system. *(NOTE: Be sure to close all programs and files prior to restarting Windows.)* Hopefully less graphics hardware acceleration will alleviate your lockup problems. If you're still having problems, return to the Advanced Graphics Settings window and move the pointer left to None. Click the OK and Close buttons again, and Windows will again ask you to click OK to reboot.

If using any of these settings ends the lockup problems, the video card is the root of the problem. You can continue using your PC with the new setting, but you will probably notice Win98 or Win95 and other programs are working more slowly. Eventually you should

Booting In Safe Mode

When you boot Windows 98 (Win98) or Windows 95 (Win95) in Safe mode, your system's startup files and device drivers will be bypassed, allowing Win98 or Win95 to start up in a basic mode. If your display driver is causing your display problem, booting in Safe Mode will cause Win98 or Win95 to use a generic display driver when booting.

Turn on the computer and wait until you hear the Power On Self Test (POST) beep, which should occur about 10 to 15 seconds into the boot process. After hearing the beep, press the F8 key. You should enter the Microsoft Windows 98 or 95 Startup Menu text menu. (If you don't see the menu, you probably pressed F8 at the wrong time. Reboot the computer and try again.) Highlight selection 3 (Safe Mode) and press the ENTER key.

Win98 or Win95 will start using the most basic configuration possible, bypassing any startup files you've set. You'll see Safe Mode in each of the Desktop's four corners. You now can make changes to your display driver, as specified elsewhere in this article. ▮

replace your video card with a newer model to permanently fix the problem.

If this doesn't fix your lockup problems, you may need to make some changes to one or several of the video card's settings. Many times, the settings of your video card are at the root of several display-related problems. We'll show you how to adjust various video card settings in Win98 and Win95.

Before changing video card settings, be sure to check your monitor's documentation for its setting limitations. If you attempt to surpass the setting limits for your monitor, you could damage the monitor. Your monitor's users guide should contain a page listing its maximum settings.

With Win98 and Win95, if you don't have your own video card driver (or display driver) you'll have two generic VGA drivers available. With Standard Graphics Adapter VGA, you can use a 640 x 480 resolution. With SuperVGA (SVGA), which is more typical with newer PCs and monitors, you'll have three resolutions: 640 x 480; 800 x 600; and 1,024 x 768. With a typical SVGA setup, the lower resolution (640 x 480) supports 16; 256; 65,000; and 16.7 million colors, while the higher resolution supports only 16 and 256 colors. As you increase resolution, the greater demand placed on your video card reduces its ability to display colors.

(NOTE: Your system's display driver and video card may have different colors and resolutions available, especially if you're using a computer built for Win98. For instance, some powerful setups allow 1,280 x 1,024 resolution and 16.7 million colors simultaneously.)

To make changes to display settings in either Win98 or Win95, open the Display Properties window, click the Start button, followed by the Settings command and Control Panel. Then double-click the Display icon. Before making any changes to your display, close all other programs and save any files you have open.

Here are the various display changes you can make.

Driver. Win98 and Win95 usually find your display driver, if one exists

on your system, while they run their hardware detection features after installation. Otherwise, the operating system will use one of the generic drivers we discussed earlier. The display driver allows Win98 or Win95 and the video card to interact.

To change your display driver, double-click the Display icon in Control Panel, then the Settings tab in the Display Properties window. In Win98, click the Advanced button followed by the Adapter tab. (In the Win95 Display Properties window, click the Settings tab and the Change Display Type button.) The Adapter Type area shows the current display driver. If you want to change the driver, click the Change button. The Win98 Update Device Driver wizard

Newer video cards running Windows 98 can use a complex combination of resolution settings and colors.

will start, walking you step-by-step through changing the driver.

In the Win95 Select Device window, you'll see all the available drivers (if the Show All Devices button is selected in the lower left of the window). Click the proper manufacturer and model and click the OK button. Win95 will prompt you for the driver diskette or the Win95 CD.

Carefully choose the display driver. Choosing an incompatible driver could cause the display to work incorrectly. You then may need to boot in Safe Mode to choose the correct driver.

Resolution. Use the Display Properties window to set the video card's **resolution**, which defines the on-screen image quality. A higher resolution means your screen will display more pixels, yielding more space for images.

A 640 x 480 resolution is the minimum standard for users with older computers, while Win98 users probably will use at least an 800 x 600 resolution. To see your current resolution, click the Settings tab in the Display Properties window. Along the right side of the window, you'll see a Desktop Area section with a slider bar. The lowest resolution appears when the slider is on the left side of the bar. Increase the resolution by moving the slider to the right. As you move the slider, the sample display at the top of the window changes to reflect your selection. *(NOTE: If you choose a resolution your card can't support with the number of colors you've chosen, Win98 or Win95 automatically decreases the number of colors in the Color Palette area of the window.)*

After choosing the resolution you want, click OK. The operating system will probably display a warning box, telling you the screen will be redrawn with the new resolution, and you'll have to click OK. After a few seconds, you should see the new resolution.

Win98 will ask whether you want to keep the new resolution, which you can do without rebooting the PC. Win95 asks you to reboot the PC to complete the resolution reset.

If Win95 can't display the new resolution because of video card limitations, your screen will remain blank for about 15 seconds. Win95 should then return you to your original resolution.

To quickly change resolution in Win98, click the Display icon on the right side of the Taskbar. The pop-up menu lets you set resolution and color combinations or, by clicking on the Adjust Display Properties command, it opens the Display Properties window.

To add the Display icon to your Win98 Taskbar, double-click the Display icon in the Control Panel. Click the Settings tab and the Advanced button. Then click the

General tab. Place a checkmark in the Show Settings Icon On Taskbar checkbox and click OK.

Higher resolutions provide greater image quality but cause Desktop icons and items to become smaller. Many times the Desktop text will be too small to read at the highest resolutions. When using Win95, you can customize the screen to return the Desktop items to near their normal sizes using the higher resolution.

Under the slider bar in the Desktop Area section in Win95, click the Custom button. (When using some resolutions, or when using Win98, the Custom button will be dimmed and unavailable.) You'll see a ruler, which you can click and drag to the right to increase the sizes of the Desktop items.

At the top of the window, there's a box showing the percentage of all of the items that will increase or decrease in size. If you have a specific percentage in mind, you can type that number in the box. Once you've made the change you want, click OK. Windows may warn you that some programs may not work correctly with the new settings. Click OK to continue. Then click OK again to restart Windows and activate the new settings. It's best to make changes in small percentage increments to avoid display problems.

Our programs all worked correctly with our customized settings, but they looked vastly different. Whether your customized settings work properly depends on your video card and monitor. If you want to return to the original settings, move the slider bar in the Desktop Properties window to the original resolution setting and click OK. Windows may need to restart to reset.

After customizing some settings, the Display Properties window and other windows may be so large that the OK and Cancel buttons will no longer be visible. Remember, you can usually activate the OK button by pressing the ENTER key. Move the slider bar to your original settings and press ENTER to return everything to its original setting.

Refresh rates. Setting the correct refresh rate for your video card/monitor

setup is extremely important. An incorrect refresh rate will cause a flickering screen and eyestrain.

In Win98 and Win95, most users will be unable to set the refresh rate. Instead, Win98 or Win95 and the display driver automatically determine the best refresh rate for your video card and monitor. However, the monitor type chosen during Win95 setup usually is a generic monitor, which probably won't match the capabilities of your monitor in refresh rates, especially if you have a newer, top-of-the-

Different resolution settings will cause your display to look different, especially if you customize certain settings in a higher resolution. The higher resolution of these two, with customized icons and system text, is on top.

line monitor. (This normally isn't a problem with newer PCs with computers running Win98.)

The best method for setting refresh rates in Win98 and Win95 is to make sure the operating system has the proper display hardware selected and the newest drivers for that hardware. In the Display Properties window, click the Settings tab. Next, click the

Advanced button in Win98. Click the Monitor or Adapter tabs to change the driver for those devices. Click the Change button to start the Update Device Driver Wizard.

In Win95, click the Change Display Type button. You can then change the display driver (adapter) and the monitor, if needed, by clicking the Change button. Don't choose a monitor type that exceeds your monitor's capabilities.

If you already have the correct hardware selected or if resetting the hardware doesn't help, try lowering the resolution. When most video cards run at higher resolutions, they lower the refresh rate, which may cause screen flickering and eyestrain.

Colors. Setting colors in Win98 and Win95 is fairly easy. As we mentioned earlier, the number of colors you can display depends on the capabilities of your video card. Using higher resolutions often will limit the number of colors you can display.

In the Display Properties window, click the Settings tab. In the Color Palette section on the left side of the window, click the downward arrow to see the number of colors your video card supports. You may see 16 Color, 256 Color, High Color or 16-bit (which is 65,000 colors), and True Color or 24-bit (16.7 million). You will only see the number of colors listed that your video card will support. Click the number of colors you want. If you choose a number of colors that your card can't support under the current resolution, Win98 or Win95 will automatically lower the resolution in the Desktop Area of the window.

As you increase the number of colors, you may notice a decrease in system performance for Win95 or for older computers, depending on the capabilities of your video card. For the average video card and the average user, 256 colors will provide the best mix of system performance and pleasing colors. For photos and other detailed graphics work, though, you may want 16- or 24-bit colors. ▮

by Kyle Schurman

The ability to e-mail
a wireless phone.

The ability to manage all your
communications online.

This Is The Web On Broadband

Faster Internet Connections Will Change Media Use & More

IF YOU ARE AS CURIOUS about the future of the Internet as we are, you probably have lots of questions. Predicting how the World Wide Web will look when we're all using high bandwidth connections is akin to choosing the SuperBowl winner in 2005 or attempting to guess who is going home with the Oscar for Best Picture next year (we'll at least wager that it won't be "The Mummy").

But after talking to Web designers who are already beginning to implement design changes in anticipation of broadband, and industry analysts who base their predictions on solid market research, we started to notice trends. Trends that suggest not just how the Web will change, but how a new, faster Internet will affect our daily lives.

Broadband Broadly

It won't be tomorrow or next week when a significant portion of Internet users get their hookup from more than a standard dial-up modem. Jupiter Communications, a computing research firm, says that only 5.4% of current online users are using broadband access, which is an Internet connection faster than dial-up modems. There are a number of inhibitors to widespread broadband connectivity, but the main one is they simply aren't available. Even if you want a broadband connection, it may not be readily available in your area.

In the next couple of years, as broadband methods such as cable modems, Digital Subscriber Line (DSL), Integrated Services Digital Network (ISDN), and even satellites become more widespread, users will adopt high-speed access at a natural rate (such as with dial-up Internet access), says Lucas Graves, an analyst at Jupiter.

In fact, by the year 2002, Jupiter estimates that nearly 20% of Internet users will be using broadband forms of connectivity. Their studies show a rough increase of 4-5% every year. If this rate continues, half the online users could be using broadband connections within ten years. Once a sizable chunk of the online populace has high-speed, always-on connections, the face of the Web will change to reflect the new online world.

Changes In The Weaving

Broadband connections allow users to download and upload data at speeds of tens or even hundreds of times faster than 28 and 56 kilobits per second (Kbps) modems. While the obvious benefit of having Web pages instantaneously leap into view will be what initially draws users to higher bandwidth, other changes will make broadband even more alluring. Once broadband is available nationwide, Graves says, adoption will continue to rise because prices will come down. In some cases, broadband connectivity can be more than twice as expensive as dial-up. For more information on installing broadband connections, see "Installing More Broadband Power" in this issue.

Multimedia. The most noticeable changes in the Web will be on the multimedia front. Audio and video transmissions have always pushed the bandwidth envelope, as evidenced by compression developments, notably the notorious MP3 format and streaming audio and video,

where images and sounds are "streamed" to a user in a constant flow. As compression continues to pack high volume sights and sounds into smaller and smaller packages, and the road that these formats travel continues to widen, we'll see and hear things never believed possible outside cyberfiction.

Darrell Stern, Web designer (http://www.advice-and-design.com) and author of the book "Internet Advice and Web Design," says that broadband will make technologies such as videoconferencing and streaming media a solid reality. "Right now, streaming is only in its infancy; it needs real speed to become a useful part of our lives," he says.

In addition to being able to stream at much higher speeds, a broadband connection makes it possible to download normally unwieldy video files in AVI and MOV format rather quickly. While an entire movie would still be too large to handle at roughly 7 gigabytes (GB), it's a snap to download a 10 or even 100 megabyte (MB) video clip. Since the quality is much better than streaming and you don't have to worry about latency issues (slowdowns, often referred to as latency or lag, exist even with broadband connectivity), Graves says we'll see more larger-sized multimedia files as broadband widens.

Even relatively small audio and video files, 1MB to 2MB in size, can be embedded into Web sites to beef up the multimedia, not to mention multimedia applications using Java and ActiveX programming controls.

Another industry poised to embrace broadband is the gaming industry. Most multiplayer games appreciate not only fast downloads, but speedy upload connections as well, says Graves. "Not just blood and guts games like Quake, but future games, for instance a simulation with a lot broader appeal—virtual worlds with immersive graphical interactive content become possible."

Some games, such as Origin's Ultima Online (http://www.uwo.com) and 989 Studios' Everquest (http://www.everquest.com), have already implemented this model of large-scale fantasy worlds

where players interact with their environment and each other. Broadband will open doors to many more such worlds. Imagine a virtual world where you can control an online version of yourself, usually called an "Avatar," and walk around exploring and conversing with other avatars. Scenarios such as this require a lot of graphical exchanges between your PC and other users' computers and greatly benefit from a high-speed connection.

Information And Interaction. Broadband technology will provide a means not just for fancier sites and ultimate gaming, but new ways of disseminating information as well.

Right now, the primary reason users sign up for broadband access is that everybody hates waiting for slow pages to download, says Graves. But that won't be enough to bring everyone to broadband. Web sites will need to incorporate new technologies and content that thrive on high-speed connectivity and appeal to the average user. "Part of the challenge of broadband is for content providers and Web services to develop interactive content that takes advantage of the new functionality and makes the case for broadband," he says.

Broadband Access By The Numbers

Year	Percentage of online users with broadband
1999	5.4%
2000	10.8%
2001	14.3%
2002	18.7%

Source: Jupiter Communications

Interaction has always been the soul of the Internet—the most popular online activity is still sending E-mail. The built-in Java chat rooms of Web sites have grown in appeal, and adding video and voice to these would benefit both home and business users.

Stern feels that quality should always come before quantity when it

comes to Web design. "What technology brings will influence what message it sends out," he says. "If advanced technology is used in a way which enhances the design and does not simply serve to show off a new applet or ActiveX control (such as an animated bullet list), then it will serve its purpose and bring the Web to a whole new level of interactivity."

So we're all hoping that Web companies will embrace broadband, not just provide demonstrations of what their site can do. Nifty little tracers that follow your mouse cursor around the screen may be aesthetically pleasing, but they're not really useful. An animated demonstration of anti-lock breaks on Ford's site, or a video teaser from Blockbuster.com, will bring a broadband user back for future visits. The changes won't happen overnight, and they'll most likely happen alongside low-bandwidth versions of the same sites.

Slow Ramp Up. "Today most smart designers are making multiple clones of their sites which fit different browsers, monitor sizes, platforms, etc.," says Stern. "This should be the same with bandwidth. Smart designers will have both a low and high bandwidth version of their sites."

Graves supports incremental change. He believes that methods of implementing broadband changes will evolve slowly and sparingly so not to alienate low-bandwidth users. "You have to build incrementally richer multimedia into Web pages. It's not like you can turn around one day and suddenly flip a switch and show live streaming CNN news reports," says Graves.

While technology will continue to squeeze the most out of existing bandwidth through compression and other methods, broadband is spurring an online revolution that's heading our way.

Changes In Our Lives

It is understood that some day—most likely sooner rather than later—our lives will become drastically

different because of the Internet. They already have in many ways. Think of your life before E-mail or before being able to research any topic of interest without leaving your desk. A broadband Internet will reshape not only our individual lives, but also society and industry as a whole.

Real-life applications. Even more important than a fast pipeline to the Internet is a pipeline that is always on, or connected. Because there will no longer be a need to dial-up before being connected, your PC and your life will become an integrated part of the Internet.

"In many ways, an always on connection is the more significant change, at least in terms of how people will use the Web," says Graves. "It enables all kinds of applications that haven't been practical under a scenario where you are dialing up for a few hours and then disconnecting."

You can even be a part of your company's password-protected network. Open file sharing and communications 24 hours a day make telecommuting not just a possibility, but a cost-effective reality. Even more mundane activities exist. For example, instead of setting your alarm, you may have an E-mail alert reliably sent to you. You may also have stock tickers and sports scores constantly running across your desktop with any noticeable lag in your connection. Even have the morning news delivered to your PC while you're making coffee! The possibilities are as endless as the Web itself.

Not all changes elicited by broadband, however, will be for the better—at least not where big business is concerned.

Broadband business. Broadband will enhance the Internet to such a point that it may replace television in some uses. It would be easier to get news on demand rather than wait for TV stations to play it in their order. However, the likelihood of television being completely eliminated is slim.

After all, experts predicted the demise of radio after television became widespread.

Stern thinks that the Web resides somewhere between print and television. "It is so new that I don't think anyone anywhere truly knows what it is really meant for yet," he says. It will find its niche, aided by broadband. While TV and radio don't have

Web sites heavy on multimedia, such as What Is The Matrix? (http://www.thematrix.com) maximize broadband connections.

anything to fear yet, many other industries have already felt the shakeup from the Internet.

Many companies reformed themselves in the Internet image. The software industry, for example, has adjusted its model to the ability of the Internet to transfer demos and shareware. How many companies have shifted to a more Internet-friendly approach of marketing and product sales? And how many have moved completely online?

Already, ripples are moving through the recording industry about MP3 files, CD-quality songs compressed into an easily downloadable size of 2MB to 3MB. What happens to the movie industry when an entire film can be sent across the Internet in perfect digital format?

"Once you've made possible the distribution of that kind of entertainment content digitally, then you're necessarily talking about at least a tweak if not a fundamental revision of business models," Graves says.

Graves thinks that entertainment companies will have to face the distribution and piracy potential of the Internet. When MP3s were first

getting noticed, record companies either ignored the problem or tried to find a way of encrypting CDs to prevent the distribution of audio files.

Neither one of these measures was in their best interest. "If [they ignored it], it actually guarantees that everything that's out there will be piracy—their absence fuels piracy," Graves says.

"And any overly intrusive and inhibiting security measures that they impose are going to have a perverse impact on the legitimate market," he says. If users constantly have to download the latest drivers that support the industry's encryption scheme, they will swiftly be alienated.

Most of what the record companies are going through now, and movie companies will go through when greater broadband and compression technologies are in place, the software companies have already experienced.

"There was a time when every piece of software you bought was copy protected—they tried everything," Graves says. This ranged from entering the 50th word on the manual's thirteenth page to entering codes from non-photocopyable paper to using a specific hardware key. None succeeded.

Today there is almost no copy protection. Developers incorporated piracy into their business model, much like department stores factor the average amount of shoplifting into their expenses.

That's doesn't mean nothing can be done. Record companies are working to make their albums available in MP3 format.

It's clear broadband will change how businesses operate. It may be the best—and the worst—thing that's ever happened to them. But as for us, we'll be telling the next generation about the Web we once knew, a Web without fancy teleconferencing or worldwide virtual reality. They'll be hard-pressed to believe us. ∎

by Joel Strauch

Browse Carefully

How To Spot Security-Conscious Web Sites

As more Web buyers use their credit cards to order things on-line, the security of information transmitted over the Internet becomes increasingly important. Many Internet sites adding new security measures to help keep your data safe. The biggest trick for users is learning how to spot these security-conscious sites, and more importantly, to recognize those not guarding the data. Knowing what to watch for makes it possible to pick sites where your information will be safe.

SSL Standard

The most popular security measure for non-military sites involves the use of Secure Sockets Layer, popularly called the SSL Standard. Netscape developed SSL encryption, and it is an extremely effective method of safeguarding data during Internet transmission. According to its developers, a high-powered computer working on nothing else would take a year to break this type of code. That kind of effort makes SSL-enabled sites poor targets for professional data thieves and way beyond the average hacker.

So how does SSL work? In simple terms, it goes like this: when you access an SSL-secured site, that site's server sends a message or digital "handshake" to your browser to identify itself. Your browser, in turn, sends back its identification handshake. This exchange of identities lets both the server and your Web browser determine whether they speak the same language and support the same encryption.

The server of the secure site and your browser also exchange a unique session ID that is valid only for that specific interaction. So if you leave the secure site and come back, the server and your browser must again identify themselves and establish a new session ID.

Once the session ID is established, the server sends your browser a digital certificate. A digital certificate (also called a security certificate) is issued by an independent certificate authority that verifies the applicant site's identification and the methods it uses to ensure security and privacy of your data. Each digital certificate consists of specific information about the certificate owner, the certificate issuer, a unique serial number or other kind of unique identification, valid dates of the certificate, and, most importantly, an encrypted fingerprint that can be used to verify the certificate. (We'll discuss more about certificate authorities later.)

Once your browser verifies the digital certificate from the secure site, your browser and the secure site's server create a master key, which is similar to the session ID in that it is valid only for that particular session.

The master key, however, is the key to the secret code between the server and your browser. Third parties cannot understand this private language without having a copy of the same master key. Since the process creates a new master key each time, getting a copy is virtually impossible. That's why SSL is so good.

Are You Secure?

There are several clues that can tip you off to the fact that you are at a secure site. The hardest to miss is a security alert notification window that will pop up in most browsers when you are entering or leaving a secure site. The drawback to being dependent on this security alert is that you can turn it off, so it's possible it won't actually notify you when you enter or leave a secure area. Another obvious clue is a security seal or logo displayed somewhere on the Web page, usually near the bottom or along one edge. The seal or logo may be as simple as a picture of a padlock or a key, or as elaborate as a certificate authority seal. It also might be a text link labeled "Security Information," "Privacy Policy," or something similar. Whatever the security indicator, you should be able to click on it to see details about the site's security.

Another indication you are at an SSL-secured site is the addition of the letter "s" after the "http" at the beginning of a site's universal resource locator (URL) address. In other words, instead of the Web address beginning with "http://" (Hypertext Transfer Protocol) it may begin with "https://" (Hypertext Transfer Protocol - Secure).

Certification Proclamation

While there are many "standards," there is no standardization of security

on the Web. Though the certification requirements of all certificate authorities are similar in that they all require verification of site security, each certification group has its own specific requirements and standards. Certificate authorities are voluntary and self-enforcing. The penalties for non-compliance with the certification authority vary with the organization and violation, but generally the penalty is withdrawal of certification.

VeriSign. The largest commercial organization that specializes in Web security, VeriSign certifies many commercial sites as being secure. Any site that displays a VeriSign seal or logo has undergone rigorous security reviews and assessments, so you can be confident that it is both secure and private. You can read more about VeriSign and its certification requirements at http://www.verisign.com.

Thawte. The second-largest provider of commercial digital certificate services, Thawte is similar to VeriSign in that it provides either individual or site security certificates. When a site displays a Thawte seal, you can be confident of its security. You can read more about Thawte's certification process and requirements at http://www.thawte.com.

BBBOnLine. This site at http://www.bbbonline.com is a non-profit subsidiary of the Council of Better Business Bureaus, and it offers a very reliable process for checking a Web site. Participants who qualify may display the BBB-OnLine seal on their Web pages.

According to their Web site, BBBOnLine's online security requirements include "the use of a secure environment for the server (such as doors, locks, and electronic security), as well as the use of encryption for sensitive personal, medical, or financial data." BBBOnLine requires its participants to be monitored and re-assessed at least once a year to ensure continuing compliance with requirements. Penalties for non-compliance range from withdrawing the

BBBOnLine seal to reporting them to government-enforcement agencies.

To be eligible for BBBOnline's seal, participants must also post a privacy policy that is "clearly displayed on a Web site's homepage and linked to any page on which the site collects individually identifiable information." To read more about BBBOnline's privacy seal requirements, go to http://www.bbbonline.com/businesses/privacy/eligibility.html.

TRUSTe. This non-profit organization has a mission to promote privacy and trust for users of the Internet. While TRUSTe does not specifically certify a site as being secure, it does certify a site's privacy practices. In other words, it certifies what the site owner does with the personal information it collects. Other Certificate Authorities may themselves be members of TRUSTe.

According to the TRUSTe rules, a site that displays the TRUSTe seal has agreed to tell you what information it gathers or tracks about you, what it does with that information, and with

Some sites prove certification by more than one service.

whom it shares it. The site also agrees to tell you about its policies on your options for "opting-out" (for example, whether you have a choice about having your name put on mailing lists). The site must also agree to tell you about its policies on correcting and updating personally identifiable information and on deleting or deactivating your name from its database.

You can read more about the TRUSTe program, as well as get

information on how to file a complaint, at http://www.truste.org. To see a list of TRUSTe members, check out the TRUSTe membership directory at http://www.truste.com.

Public Eye. Though it is not actually a security authority, Public Eye monitors commercial sites for privacy, reliability, and customer satisfaction. Site security and reliability seem to go hand in hand, so Public Eye sites are typically also very security conscious. Sites certified for reliability and privacy by Public Eye usually display the Public Eye seal. For more information about Public Eye monitoring and certification, visit the site at http://www.thepubliceye.com.

CyberCash. For commercial sites, another clue to the level of security is the use of CyberCash. The CyberCash company specializes in secure electronic payment solutions. CyberCash provides its clients with secure methods of accepting online forms of payment including payments by credit card, cash, and check. For more information on CyberCash, go to http://www.cybercash.com.

Even if a site does not display one of the seals or logos mentioned here, that does not necessarily mean it is not security conscious. As you've probably guessed, security certification carries an expensive price, and some companies are not willing or able to pay that price. Some of these companies are, nevertheless, still security conscious.

If a site displays a link to its privacy policy and an explanation of its security practices, chances are good that it is a secure site. Just look for any combination of those magic words: encryption, SSL, security, and privacy. If there is any discussion of those words, or any link to information about the site's policies regarding those concepts, chances are it's secure. Read the fine print at such sites first, so you know your data is safe before you hand it over. ▮

by Betty Champagne Guthrie

Compiled by Jeff Dodd & Joel Strauch

Useful Services

Alert!Web
http://www.alertweb.com

Alert!Web cannot type 75 words per minute or get you a cup of coffee, but it's as good as any secretary for reminding you of the important events in your life, such as special holidays and urgent meetings. Alert!Web can also notify you when your favorite stock and commodity investments reach a specified price; when your portfolio needs balancing; and when it's time to mail your bills.

Hallmark Reminder Service
http://www.hallmark.com

Hallmark knows that it doesn't do much good to send the very best if the very best isn't going to get there on time. That's why the greeting card giant offers a reminder service. This free service helps you avoid sending out belated wishes by reminding you of birthdays, anniversaries, and all the major and minor holidays. Simply register with the site and enter all the dates you don't want to forget. Then it's just a matter of checking your E-mail regularly and buying the appropriate greeting cards.

moviefinder.com
http://www.moviefinder.com

The moviefinder.com reminder service will send you a personal E-mail message to remind you of the release of a new movie in the theater or the airing of an old movie on TV. To take advantage of this service, you must first register with moviefinder.com. When that formality is out of the way, browse through the television and movie listings until you find something that catches your attention. Finally, click the Remind Me box that corresponds to the program you want to see. You'll find a reminder in your

E-mail inbox within 48 hours of the scheduled release or airing.

Spam Recycling Center
http://www.chooseyourmail .com/spamindex.cfm

The ancient Egyptians had to cope with frogs, locusts, and the angel of death. Today, we have junk mail, telemarketers, and spam (mass-distributed E-mail messages). Fortunately, the Spam Recycling Center offers a way to deal with the latest version of these modern plagues. The site's best feature is spamrecycle@chooseyourmail.com, an E-mail address to which you can forward any spam you receive. Spam messages are then given to the Federal Communications Commission (FCC) and other appropriate federal agencies for investigation. The site also provides an anti-spam petition you can send electronically to your congressional representative. Plus, to thank you for your help in the fight against spam, the Spam Recycling Center offers a coupon for five dollars off your next purchase at CDNow, an online shopping center.

Stoneage Oil Change Reminder Service
http://www.oilchangereminder.com

Experts suggest changing the oil in your car every three months or 3,000

miles. The free reminder service from Stoneage helps you remember to do it. The Stoneage Oil Change Reminder Service will send you an electronic notice when it's time to have the oil in your car changed. To register, provide your name and E-mail address, as well as the year, make, and model of the vehicle you drive. While registering, you'll also need to include your vehicle's current odometer reading, the average number of miles you drive each week, and the date and mileage of its most recent oil change.

Student.Com TV Perpetual Reminder
http://student.tvgrid.com/remind

Do you want to spend more time watching TV and less time reading TV listings? You can when you register with the Student.Com TV Perpetual Reminder service. This free service sends you an E-mail message whenever one of your favorite TV shows is scheduled to hit the airwaves. The Perpetual Reminder service not only sends reminders for specific shows, but it also sends you reminders for sports programs and movies that fall into any genre you specify.

TracerLock
http://www.peacefire.org/tracerlock

TracerLock is a unique service that monitors the Alta Vista search engine for any new Web sites that may be of interest to you. After registering with TracerLock, simply provide the search criteria you are looking for and define how recent the information must be. TracerLock then searches the Alta Vista search engine each night looking for your specifications. When it finds new sites that match your criteria, it sends you an E-mail message containing the names and URLs of those sites. This is an invaluable service for anyone who uses the Web for research, and because TracerLock is free, it's one product users shouldn't pass up.

Quick Fixes

Most of today's software and hardware can benefit from a few updates, patches, and add-ons downloaded from the Internet. This month we focus on the Microsoft Office suite of programs.

Microsoft Office Update

The official site from Microsoft includes add-ons, patches, and updates for all the applications included in Microsoft Office version 95, 97, and 2000.
http://officeupdate
.microsoft.com

Office 97 Service Packs

You can download the Office service packs from Microsoft's official Web site, but it's easier to find them on the better organized File Farm Web site.
http://filefarm.com/win
/updates/officeupdates

Woody's Portal To Microsoft Office

A guy named Woody dug through all the updates, support answers, and tools for Office just so you wouldn't have to and then created a page with links to the best of them.
http://www.wopr.com/wopr97/office97.htm

That's News To You

Finding the appropriate Usenet discussion group to match your interests can be a monumental task. So each month we scour the tens of thousands of newsgroups out there and highlight the newsgroups that delve into popular topics. If your Internet Service Provider (ISP) doesn't carry these groups, ask it to add the groups to its list. This month we've selected the field of medicine.

Alt.medicine. This group may be quiet sometimes, but it's a good one for general discussion of the medical practice.

Misc.education.medical. If you're in medical school, or interested in the learning curve, this Usenet discussion group will keep you well schooled.

Talk.politics.medicine. On the other hand, if you've got something to say about Dr. Kervorkian's practice, this is the group to voice opinions.

Share The Wares

Some of the best apples in the online orchard are the free (or free to try) programs available for download. Each month we feature highlights from our selections.

Family Runner

If your family is like most, the word "organized" would be one of the last words used to describe it. Enter Family Runner. This family-oriented organizer from Integra Computing handles all the scheduling needs of your family. It is a calendar-style program that can prepare a wide variety of planners and reports for individual family members or several at once. If an event is postponed or a due date missed, the program's drag and drop feature makes it easy to move appointments up a day or two. You can also set up recurring dates, such as birthdays and anniversaries, and view religious holidays.

Family Runner is a 950 kilobyte (KB) download and is available at http://members.aol.com/integrabp. It works with Windows 95/98 and Windows NT and costs $35 to register.

Copernic 99

Sifting through online search services can be a time-consuming way to find what you're looking for. Fortunately, there are many software searchers that allow you to query multiple services at once. Copernic 99 is one of the best. Better yet, it's free. Just enter a keyword or phrase, and Copernic gets the results from up to 32 search services at once and ranks them according to relevance. The software also searches through newsgroups, places to purchase books, and for E-mail addresses.

You can upgrade to Copernic 99 Plus, which gives you 18 additional search categories including Business & Finance, Health, Movies, and Tech News, but Copernic 99 is freeware. You can download the 2.1MB program from http://www.copernic.com. You'll need at least version 3.0 of Netscape Navigator, or Internet Explorer and Win95, 98, NT to run Copernic 99.
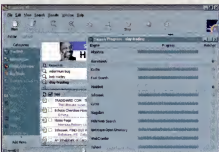
Use Copernic 99 to sift through newsgroups when performing searches.

Compiled by John Lalande
Graphics & Design by Lori Garris
& ReBecca M. Toof

The Ever-Shrinking World Of Computing

The computer on your desk is much more powerful than the computers we used to send spaceships to the moon. Likewise, it's much more powerful than the first digital computer, the ENIAC. That computer was two stories tall, used about 18,000 vacuum tubes, and weighed almost 30 tons. It could handle 357 instructions per second, which is about the speed of a pocket calculator.

The dramatic increases in computing power—and decreases in physical size—reflect continuing advances in microprocessors. Vacuum tubes, which powered the first computers, were eventually replaced by transistors. Then, with the advent of the microprocessor, transistors became so microscopic that hundreds, thousands, and even millions of them could fit onto a postage stamp-sized piece of hardware.

Since 1965, the number of transistors on a microprocessor has doubled every 12 to 18 months. As this number increases, so does the computational power. In the past 20 years alone, Intel has gone from 29,000 transistors on its 8088 chip, used in some of the first PCs, to 9.5 million transistors on today's Pentium III chip.

Computer components, such as hard drives and modems, have also grown smaller. Most peripherals, such as modems, have their own processors now. The same advances that helped designers pack more power in a microprocessor have also helped make smaller processors for components, thus creating smaller peripherals.

Continual advances in machining technology and refinements in hard drive technology have made manufacturing high-capacity hard drives in an extremely small package a possibility. IBM's first hard drive stored 2,000 bits of data per square inch. Today's hard drives use more precise magnets and better platters to fit hundreds of millions of data bits into each square inch. Another way developers stretched the limits of the technology was by separating the read/write head into two heads. By doing so, they boosted the maximum capacity of a 3.5-inch hard drive from 1.3 gigabytes (GB) to 16.8GB.

Software improvements for computer components have also helped to boost their power capacity. For example, most 56 kilobits per second (Kbps) modems aren't much smaller, physically, than their 9,600 bits per second (bps) predecessors. But, thanks to improved modem processors and new communications standards that take advantage of the increased power, the 56Kbps modems boast a near six-fold increase in transmission speed.

As computing power steadily increases at much the same pace for the next 20 years, Intel predicts that by 2012, we'll be able to fit 1 billion transistors onto a microprocessor that will operate at 10 gigahertz (GHz). Today's Pentium III, by comparison, has 9.5 million transistors and a top speed of about 550 megahertz (MHz). The limitations of the microprocessor's form, the silicon wafer, will eventually make it impossible to be any more precise—at least if we continue to develop transistors that are so big.

Beyond 2017, when Intel predicts we'll reach the physical limitations of

1943

ENIAC, the first digital computer, is completed. It relies on vacuum tubes for power.

1959

Transistors and printed circuit boards replace vacuum tubes in "second generation" computers.

silicon wafers, further advances in computing power may come in the form of nanotechnology, which, theoretically, will arrange individual molecules and atoms to form even smaller transistors and circuits. By operating on such an incredibly small scale, millions more transistors can fit into the size of a sugar cube. One researcher predicts a nanotechnology-powered processor of that size could handle a billion billion (yes, a *billion billion*) instructions per second. That's millions of times more power than is available today. For example, computers with Pentium III processors can now perform over 200 million instructions per second. Nanotechnology, however, is still a long way off, and there are some industry experts who doubt it can be done at all. ▮

Processing Power

A single rack of vacuum tubes from the ENIAC (left) is almost as tall as the woman holding it. The ENIAC included 18,000 of these vacuum tubes. Today's Pentium III processor (above) is millions of times more powerful than the entire ENIAC computer. Nanotechnology (bottom), if realized, will manipulate molecules and atoms to pack billions of times more power into a processor the size of a sugar cube.

Credit: Al Globus, NASA Ames Computational Molecular Nanotechnology Group
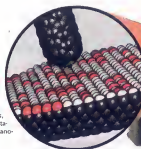
1993	1999	2010+
Intel introduces its Pentium processor to the world. It has 3.1 million transistors and a top clock speed of 66 megahertz (MHz), enabling it to perform 100 million instructions per second.	The Pentium III processor is introduced in February, boasting three times as many transistors as the Pentium and a top clock speed that's more than eight times faster.	Various experts predict nanotechnology will become feasible as early as 2010; others don't think it will be a possibility until the year 2100.

Need help with your hardware or software?
Looking for simple explanations on technical subjects?
Send us your questions!

Windows 95/98:

Q: *There's a little section of the Taskbar, between the speaker icon and the Start button, with tiny Internet Explorer and Outlook Express icons on it. How can I remove, add, or shuffle programs in that region? I searched for Help on the Taskbar and got about 50 topics, but none seemed relevant.*

A: The region in Windows 95 and Windows 98 with the tiny speaker icon is the System Tray, and the area you're interested in is called the Quick Launch toolbar. You can remove a Quick Launch icon simply by right-clicking it and selecting Delete from the pop-up menu. To change the order, simply click the icon, drag it left or right to its new location, and release. To hide the Quick Launch toolbar, right-click next to it and select Toolbars from the pop-up menu. Select Quick Launch to remove the check mark next to the name, and the toolbar should disappear.

Adding something to Quick Launch gets a bit more tricky. First, you'll have to open the Quick Launch folder (located at C:\WINDOWS\Application Data\Microsoft\Internet Explorer\Quick Launch). To get to the folder the easy way, click the Start button, select Find, then Files or Folders. In the Named box type "quick launch" (with the quotation marks), select your hard drive under the Look In section, and click the Find Now button. When the folder appears, double-click it. If the window opens to a list of file names instead of icons, open the View menu and select Large Icons. If you want to add an icon of your favorite shortcut to your Quick Launch, simply drag the icon into the Quick Launch folder. You can add a shortcut to Quick Launch and still keep a copy on the Desktop; just hold down the CTRL key when you drag and drop the shortcut.

Before you begin a power supply replacement job,

double-check

the simple stuff.

Utilities:

Q: *Does anybody have any creative suggestions or know of any utilities for extending the life of a 30 day free-trial CD-ROM?*

A: Yes, there are some ways, but we wouldn't print them. The practice is illegal. Besides, it's just not nice to cheat a software maker, especially one courteous enough to offer a free trial period.

Extending the life of trial software may seem like a victimless crime, but there are people whose livelihoods depend on sales of the software they help develop. If the software is good enough to keep beyond 30 days, you should buy it. If you simply can't afford it, here are some better alternatives:

• Search the Web for a legal, used, and presumably cheaper copy of the software.
• Search the Web for clearance sales on the next-to-newest, but not-quite-current, version of the software.
• Search shareware and freeware sites for other software that'll do the same job for less.

Computer Hardware:

Q: *My computer's not turning on when I flip the switch to "on." Is there a way I can tell whether the problem is the power supply or a bad power switch in the case?*

A: A dead power switch, which costs about $5 to replace, is better than a dead power supply, which can cost $40 or more. Neither is very hard to replace if you're comfortable going into a computer case and working with a few wires. A failed power supply is one of the most common causes of dead PCs. Often a power supply will fail partially first, provoking untraceable and confusing problems—such as the system rebooting itself in the middle of a workday. Eventually, it just dies.

Before you begin a power supply replacement job, double-check the simple stuff. There's nothing more frustrating than wasting time on sophisticated repairs only to realize you ignored a very basic and easily solved problem. First, check carefully to see that your computer's power plug is firmly in the wall socket and that the plug's other end is firmly in the back of your computer's case. If you have surge suppressers or power control switches between the wall plug and the computer, temporarily remove them from the system to make sure they aren't the problem. If that all checks

out, make sure there is power getting to the AC wall plug (plug in another item and see if it runs).

After eliminating these basics, it's time to get more serious. Sometimes a bad accessory card or other device feeding from the power supply can cause it to shut down. Try taking the power connectors (not the flat, gray data cables) off the CD-ROM drive, hard drive, and diskette drive. Then try removing any non-essential expansion cards one at a time. If either trick gets the system to boot up (even part of the way), the problem may be neither the power switch nor the power supply, but the peripheral you just unplugged.

If these tricks don't work, the next diagnostic step is to put a voltmeter/ohmmeter on your system while the power is on. Be warned, however, that this can be harmful to the board if you short something with the probes. Also, there is a slight chance of danger to yourself if you put probes on the main power switch without taking high voltage precautions. That is because with switch terminals are the only exposed point in the system with the full 120-volt wall-current kick behind it. If you don't already know how to use a voltmeter safely around a live board, we won't detail it here. Because if you don't know, you should probably let a repair person take it from here.

But there is one simple, safe voltmeter diagnostic trick for this situation. Unplug the computer. Open the case and disconnect all the wires from the on/off switch, marking their order so you can reconnect them later. Set your voltmeter to measure ohms (resistance). There are usually four terminals on the power switch, so connect the ohmmeter across the pair of connectors that feed power to the power supply and then flip the switch off and on. The resistance reading should flip back and forth between about zero ohms and the top of the ohms scale. If it stays either at zero or stays high on every possible pair of switch terminals, then the switch is surely the culprit. (NOTE: We're assuming you have one of the millions of pre-1998 AT-type power supplies, not a newer ATX type. The power switch on ATX power supplies operates differently, and our trick doesn't apply to them.)

Q: I'm putting an Intel Celeron CPU in a new system. Unlike the Pentium II and III processors that require 100 megahertz (MHz) dual-inline memory modules (DIMMs) for RAM, the Celeron only requires 66MHz DIMMs. Can I use 100MHz-rated DIMMs with a CPU that only requires 66MHz DIMMs? I want to do that because someday I may upgrade the CPU to a PII or PIII and I won't then have to buy new 100MHz DIMMs.

A: A RAM installation is often one of the most productive and painless hardware upgrades you can perform. Getting the right RAM, however, has become a complicated issue. Even once you know you need, say, 64MB SDRAM DIMMs running at 100MHz, you still need to decide on parity or non-parity RAM, error-correcting code (ECC) or non ECC, Latency 2 or Latency 3, and a mess of other technical details. The safest thing to do is to buy RAM specifically certified by your motherboard or PC manufacturers as tested and compatible with your system. The next best thing is to get RAM certified to meet the PC-100 standard, which means it will work in the 350-MHz PII and higher PCs, which use 100MHz bus speeds. It also helps to buy RAM with a money-back compatibility warranty.

The answer to your specific question is "yes." If the RAM meets all the other conditions for your machine, you can use the faster-rated RAM. This is a reasonable strategy to protect your CPU upgrade path, as long as you're sure you'll add that PIII in the relatively near future. But if you wait too long to upgrade, new technologies—from better processors to improved buses that use faster RAM—could change the playing field and make your decision to go with PC-100 RAM a moot point.

Q: I am very interested in purchasing a digital camera but I don't really understand the concept of resolution and pixels. When the specifications for a camera are given as 1,024 x 768, what does this mean? How does that compare to regular film?

A: We'll cover some of your basic questions, but for a more in-depth article on digital cameras you may want to look at "Focusing On Digital Cameras" in the August 1999 issue of Smart Computing.

The specifications on digital cameras make it hard to directly compare their resolution, let alone the quality of color accuracy, against the capabilities of a properly used 35 millimeter camera. The numbers 768 x 1,024 means the image is 768-pixels tall and 1,024-pixels wide. Smart Computing defines a pixel as the smallest part of an image that a computer printer, display, or digital camera can control. An image on a computer monitor consists of hundreds of thousands of pixels, arranged in such a manner that they appear to each be connected. Each pixel on a color monitor comprises three colored (blue, red, and green) dots.

When comparing digital cameras, experts use megapixel ratings. To get a camera's megapixel rating multiply the two figures for resolution and divide by

1,048,576 (or just by 1 million if you're looking for an approximation), and that's the megapixel resolution rating. A camera with a resolution of 1,024 x 768 offers about 0.75 megapixels resolution. Some camera makers claim image enhancement technology or software can produce images with much higher resolutions, but you need to stick with the actual resolution the camera can produce, not electronically enhanced figures.

For comparison: A 35 millimeter negative or slide has a megapixel resolution of 10 to 30. And this says nothing about film's better ability to show high contrast and subtle and brilliant colors.

The bottom line is, if you typically print pictures at least 4 x 6 inches and not more than 8 x 10 inches on a decent inkjet color printer, you'll probably be very happy with the quality of any digital camera that has a 1-megapixel resolution. And if you mostly view pictures on your computer's monitor (where you'll rarely use more than 1,024 x 768), you'll probably be satisfied with as little as ½-megapixel resolution. If you want to blow things up to 8 x 10 inches and higher, yet keep top-notch quality, you may need to go for a 2 megapixel camera.

Online Communications:

Q: *Some modem boxes say they include WinModem, some say they include WinFax. I'm not sure which will work with my Win98. Can you explain the difference between WinFax and WinModem?*

A: They are very different things, but either will probably work for you. Either should say on the box whether they're for Win95, Win98, or Windows NT.

WinFax is a utility program from Symantec (http://www.symantec.com/winfax/index.html) for sending and receiving faxes using your computer and a fax modem (virtually all modems today are combination units that include faxing capabilities). The full version of WinFax (called WinFax PRO) is quite elaborate and includes many features. It includes the ability to create fancy cover pages, to do optical character recognition, and to add a note to an existing fax

Virtually all

modems today

are combination units

that include faxing

capabilities.

and send it on to others. The free version of WinFax, which comes with some modems, is WinFax Lite. Unless you really want the other features, the Lite version will probably do everything you need it to do.

When somebody mentions WinModem, they're talking about a utility program specifically required for use with certain models of less-expensive modems. They're less-expensive units not because they're an inferior product, but because some of the functions that are built-in to normal modems are in the software for these models. WinModem software should always be included with a modem that needs it to run. Some modem boxes say "Windows required," which is an indirect sign it uses the WinModem software drivers (the other modems can run without Windows). WinModem is also a model series name for some 3Com/U.S. Robotics-brand modems.

Q: *How can I download my messages from my Internet service provider (ISP) and still have them there to download again later? I'm going on vacation and will be able to download my E-mail messages on my friend's computer, but will also want to download them again into my own computer when I get back.*

A: For starters, we assume you have a generic ISP rather than an online service such as America Online or CompuServe, which have their own ways of doing what you ask. If you're using an ISP the way you need to do this depends on what type of E-mail client you're using when you access your account from your friend's computer. (We'll also assume you know how to change your friend's PC settings so you can dial-in to your ISP.)

Before we begin, a brief lesson on E-mail servers. Generally, when you connect to your ISP and download your messages, those message are removed from the ISP's server. That means you now have the only copies stored on your PC, and if you go back later they won't be there. If, for example, you're using Outlook Express on your friend's PC, you can change the setting so the program will leave a copy of each message behind. That way even though you have downloaded them on your friend's computer, they'll still be there for you to retrieve when you get to your home PC.

From inside Outlook Express, click the Tools pull-down menu, then select Accounts. Click the Mail tab and be sure to highlight your correct ISP account. Now select the Properties button, then the Advanced button. At the bottom of the Advanced options is Delivery. In it, you'll find a box saying Leave A Copy

Of Messages On Server and click it. That's all there is to it.

Remember, though, if you don't retrieve those messages from a PC that deletes them, they'll start to stack up on your ISP's server. Some ISPs limit how many messages they will store, and if you collect too many you may actually lose some of your messages. There are several ways to make sure your old messages don't hang around too long and cause problems.

In the same Advanced options section of Outlook Express you'll find some other tools you can use. One lets you tell the ISP's server to delete messages that have stayed there for more than a certain number of days (you pick the number). Or you can instruct the program to delete messages after you've moved them to your deleted messages folder in Outlook and actually deleted them from there (Outlook will store messages in the deleted file until you delete them again, or set the program to do it upon exiting).

If you're worried about mucking around with all these Outlook Express controls, there is one other way to ensure your E-mail is at home waiting for you (aside from just waiting until you get there to check it). Before going back home, you can forward any worthwhile messages you've downloaded to your friend's computer back to your E-mail address for a second download at home.

Miscellaneous Software:

Q: *I have Lotus 1-2-3 Release 5 for Windows 3.1. I have tried it on Win98, and it seems OK, but I am not sure there aren't some hidden compatibility problems. Will this software be fully compatible with Win98, or if there should be any changes/additions, could anyone tell me what they should be?*

A: The vast majority of Win3.1 programs run pretty well under Win95 and Win98 (and even under WinNT). A few run even better than they did under Win3.1. They have a few limitations, however, such as not allowing long descriptive file names, and they may also be a bit more prone to lockups and crashes than versions designed for Win95 and Win98. Occasionally you'll find a specific feature, particularly a system-wide feature, that doesn't work quite right. For example, some Win3.1 programs won't accept text pasted from newer programs when run under Win95 or Win98. That's nothing too extreme.

If you do encounter a weird problem, sometimes the utility MKCOMPAT can fix it. Microsoft includes the utility with Win95 and Win98. It uses little pieces of code to help an older program get around its limitations and run more smoothly under the newer operating system. To access this handy utility, click the Start button, select Run, and then type MKCOMPAT to bring up some options.

In general, the older a Win3.1 program (also known as a 16-bit Windows program) is, the more likely it'll have trouble running under Win95 or Win98. Some Win3.1 program boxes exclaim "Runs under Win3.1, Win95, or Win98," which means you'll run the exact same program under all three operating systems. A manufacturer does that when its software doesn't tremendously benefit from being re-written as 32-bit (true Win95, Win98, or WinNT) code. It saves the trouble of writing two versions (one for Win3.1 and one for Win9x) and doesn't give up on selling the product to people still running Win3.1 computers. Sometimes you'll run across software packages that read "Win3.1 and Win95 and Win98 versions enclosed," which means the manufactuer included a different program for Win3.1 than for Win95 and Win98.

The bottom line is, if your version of Lotus 1-2-3 for Win3.1 seems to behave, you're probably OK. If it drives you crazy with problems, upgrade to a real Win95 version of 1-2-3. We found several offers for unopened copies of the latest version of Lotus SmartSuite for Win9x (which includes 123) on the Internet for less than $30. ∎

The vast

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Win3.1 programs

run pretty well under

Win95 *and* *Win98*

(and even under WinNT)

Answers to users' most common questions.

Chat 101

FAQ: *Why should I be interested in chatting online?*

Chatting online has become a popular way to meet new and interesting people from around the world. You can hang out in virtual "rooms" based on nearly any topic imaginable, from sports to politics to finance. Chatting is a fun way to share your opinions with others and to hear their opinions, in real time. That nearly instant response time is the great advantage chatting has over other online communications such as E-mail. Plus, in a chat room you can carry on a conversation with 20 or so people at once.

Here's a quick overview of how it works. First, you register and log on for a chat session. You should see a list of available rooms. Find one that looks interesting to you and hop in. You should see a list of all the people who are chatting in that area, an area where you can type in your text, and a window where all the text from your fellow chatters appears.

Type your message in the correct box and press ENTER, or click the Send button, which should be next to the message box. Your message will instantly appear for all to see. Again, this takes place in real time, so be prepared for new messages to appear continuously.

FAQ: *What do I need to be able to chat online? Any special software or hardware?*

You don't need much to get started. A computer, a modem, and an Internet browser such as Netscape Navigator or Microsoft Internet Explorer will get you to a chat room. In some cases you may have to download additional software to join some chats. For example, to enjoy the popular ICQ you'll need to download software from the site at http://www.icq.com.

FAQ: *Where do I go to chat?*

Many sites offer chat areas. If you use AOL's online service, try the People Connection section. If you're on the Web, AOL (http://www.aol.com), Yahoo! (http://www.yahoo.com), Talk City (http://www.talkcity.com), and many other portal sites also offer chat areas. With a little searching, you'll find more niche-oriented chat sites, such as the

computer-related areas at *Smart Computing*'s Web site (http://www.smartcomputing.com). The first time you visit a chat area, you'll be asked to register a user name or alias and a password. The user name will be the name you use in chat rooms.

FAQ: *Does it matter what name, alias, or handle I use when I register for a chat area?*

You should be able to use whatever name you like, unless another person has already registered the name. Most people choose clever nicknames, or something that indicates something about themselves.

FAQ: *I've registered for a chat site. Now what?*

Hop in! Most chat sites have rooms based on just about every topic available, and some even have rooms based on regions of the world. That means you can end up chatting with people "across the pond," or in your own neighborhood. Usually you only have to double-click the name of a chat room to enter it. If that doesn't work, highlight the name of the room you want to join, and look for an Enter button.

FAQ: *I don't see a room about a topic I'm interested in. Can I make my own?*

Many sites will let you create a room of your own if you don't find one to your liking. Different chat sites offer different means of creating a new room. Usually, you either click a Create Room button or open a menu in the menu bar of your chat graphical user interface (GUI). You'll have to give your room an appropriate name, and you may have to choose whether you want your room open to the public, or accessible only to people you invite.

FAQ: *Some of these people are using profanity! What can I do to avoid it?*

Profanity in chat rooms is an unfortunate inevitability. However, most chat room sites give you tools to avoid this harassment. You should be able to ignore messages with a couple of mouse clicks, and some chat sites also let you screen out profanity.

FAQ: *Someone is asking me for my password. What should I do?*

You should never give out your password or other personal information to anyone in a chat room, even if they claim to work for the site you are visiting. Chances are they don't, and a legitimate employee would never ask for such information anyway. Keep your private information just that—private! ▯

*When you need help resolving computer service problems,
bring your questions to Action Editor.*

Rebates Revisited

*In early 1999, I purchased a scanner and sub-
mitted the proper rebate paperwork to Digital
Research Technologies. I didn't get my rebate so
I tried telephoning them without any luck. I did,
however, get a response to my E-mail message, saying I
should have my $30 rebate within two weeks. I didn't re-
ceive it. I tried sending the company an E-mail message
again. This time I didn't get a response. Can you help?*

JEANNIE EMAN
SHERIDAN, WY

We have received numerous requests for help with
Digital Research Technology (DRT) rebates. We con-
tacted DRT's rebate-information telephone line at (888)
221-4933 and spoke to Laurie, a very helpful representa-
tive who says there are two reasons for recent DRT re-
bate delays. First, DRT recently contracted a new
third-party company to process rebates due to com-
plaints of poor responses from the company that for-
merly handled these duties. Thus there was a delay of
nearly two months in the processing of DRT rebates
while the new third-party company transferred all perti-
nent data to their files. Second, a new holding company
recently purchased DRT, and this temporarily froze its
banking transactions. Laurie then went on to inform us
that Jeannie's rebate had been printed. She then gave us
the check number and said the rebate would be sent that
day (a Friday) or the following Monday. The moral of
the story: If you're waiting for a DRT rebate, take heart.
DRT has taken steps to correct its rebate problems.

*In January 1999, I purchased a Mustek
TwainScan 600 III EP Plus scanner. On Jan.
21, 1999, I sent in the coupon and required in-
formation for my $30 rebate. After 18 weeks (the
coupon said to allow 16 weeks), I still had not received
my rebate. I obtained a fax number for the rebate offer
from the Mustek Web site and faxed the paperwork and
a cover letter. I still have heard nothing. I would appre-
ciate any help you could offer.*

SUZI GOODELL
BOCA RATON, FL

Mustek is another company about which we've re-
ceived several complaints of overdue rebates. We sent a

fax to Mustek's rebate fax line and placed a call to Gigi
Harris, Mustek's director of marketing. Gigi returned our
call promptly, and we explained Suzi's plight to her. Gigi
apologetically explained that the Mustek department that
handles rebate processing had recently experienced a
huge turnover in personnel. As a result, Mustek hadn't
processed a rebate since March 1999. She said that new
personnel were in place, and that within two weeks or so
Mustek's rebate processing would be up to date. Later, we
received an E-mail message from Suzi informing us that
her rebate had arrived in the mail. Suzi's story demon-
strates that in most instances of late rebates, companies
aren't trying to pull a fast one. They are simply experi-
encing internal difficulties or the larger-than-expected re-
sponse is overwhelming its rebate department.

*I bought a UMAX 1220S scanner on Jan. 2,
1999. It does not work properly. I have repeat-
edly tried to get support, but have been unable
to get a human any day of the week. I would like
my money back; I have a product that does not work.*

RICHARD STEVENS
TRINIDAD, CA

Despite several attempts, we also had trouble reaching
a human at UMAX. We finally contacted Laini Nance, an
extremely helpful public relations executive with a third-
party firm that handles public relations for UMAX.
Shortly thereafter, Steve Walker, a UMAX tech support
manager, contacted Richard. Steve sent him a newer ver-
sion of Adobe PhotoDeluxe (version 3.0) at no charge.
Although this helped, it didn't fix the problem com-
pletely. After further communication with Laini, another
UMAX technician sent Richard a new Small Computer
System Interface (SCSI) card and cable. This solved the
remainder of his problems, except for the fact his rebate
was late in arriving. Thanks to Laini, however, Richard
did receive his rebate. Even though the company resolved
Richard's problems, UMAX's customer service disap-
pointed him. He believes that without our help and the
help of Laini (who is not employed directly by UMAX),
he would have made no progress with UMAX. ▐▐

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service from a manufacturer? If so, we want to help solve your
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the problem you had with customer service. In billing disputes,
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bandwidth—The capacity a network or data connection has for carrying data. For analog transmission, bandwidth is the difference between the upper and lower transmission frequencies in a given range. It is measured in cycles per second or hertz (Hz). For digital transmission, bandwidth is measured in bits per second (bps), and the larger the bandwidth number, the faster the digital transmission. This speed is important for input/output devices because a bus with a low bandwidth could restrain a faster I/O device from performing at full capacity.

broadband transmission—Communication in which the wire or line can transmit several data streams simultaneously. One example is the coaxial cable used in cable television systems, which carries multiple channels at once. More recently, broadband has come to describe high-speed data transmission, especially over the future Internet, sufficient to carry live video on demand.

data encryption—The transcription of data into an indecipherable code for security purposes. Users cannot view or use encrypted data until their computers convert the data into its original form. The government-approved method in the United States is the Data Encryption Standard.

Digital Subscriber Line (DSL)—Technology used to transmit digital data on regular copper phone lines. DSLs can provide connections to the Internet or local-area networks (LANs) or for videoconferencing.

download—To retrieve an application or file from another computer through a network connection or modem. Download is synonymous with "receive," while upload is synonymous with "transmit."

File Transfer Protocol (FTP)—A standard way to transfer files between computers. The method has built-in error checking. It is frequently used as a way of transferring many types of files over the Internet.

host—A computer that shares information with other computers, or the act of sharing information with or providing services for other computers.

Hypertext Transfer Protocol (HTTP)—The set of standards that let users of the World Wide Web exchange information found in Web pages. Web browser software reads documents formatted and delivered according to HTTP. The beginning of every Web address, "http://," tells the browser that the address' document is HTTP-compatible.

Integrated Services Digital Network (ISDN)—A telecommunications network that allows for digital voice, video, and data transmissions. ISDN replaces the slow and inefficient analog telephone system with a fast and efficient digital communications network.

integrity—The quality of data when keeping it in its original form and making sure bits and pieces are not inadvertently changed or erased. Integrity most often is compromised by programs gone awry or viruses written to wreak havoc on data.

interface—A communication link in a computer between hardware and software components. A user interface is the way a user communicates with a computer. As a verb, to interface is to communicate.

patch—A piece of code inserted into a program to temporarily fix a defect.

path name—The file name designation that shows the user where to find

a file in a hierarchical system. For example, the path name C:\NOVICE\STORY\Index.doc indicates the file Index.doc is in the STORY directory that resides in the NOVICE directory on the C: drive.

PC Card—A credit card-sized device that plugs into a PC Card slot and enables the user to add additional computer peripherals including modems, sound cards, and CD-ROM drives. They are primarily in portable computers.

Secure Sockets Layer (SSL)—The most popular security protocol for the Internet, provided by Netscape Communications Corp. SSL encrypts data that passes over the Internet. Netscape Navigator and Microsoft Internet Explorer support SSL.

T1—A type of data connection able to transmit a digital signal at 1.544 megabits per second (Mbps). T1 lines often are used to link large computer networks together, such as those that make up the Internet. Although T1 lines can support video, it is not TV-quality, full-motion video.

T3—A type of connection from a computer to the Internet, transmitting a digital signal at 44.746 megabits per second (Mbps). Not yet widely used, the T3 connection is more than fast enough to support data transfers necessary for full-screen, full-motion video.

universal resource locator (URL)—A standardized naming, or "addressing," system for documents and media accessible over the Internet. The URL http://www.smartcomputing.com, for example, includes the type of document (http, Hypertext Transfer Protocol), and the address of the computer on which it resides (www.smartcomputing.com).

Plan On PCs Staying Put

Innovative Alternatives Abound, But Desktop Machines Won't Disappear Anytime Soon

DESPITE ITS AMAZING SUCCESS STORY, the PC is having a surprisingly difficult time convincing many people that its future is as rosy as its past. Market research superpower GartnerGroup, for example, predicts household PC penetration will climb from 50% to a peak of 65%. Gartner's prediction builds on several factors, including decreasing consumer intent to buy PCs and the fact that about 60% of home PCs are less than two years old, indicating a slow replacement market.

This doomsaying comes despite recent billows in the sails of PC sales, which were up about 20% in 1999's first quarter. International Data Corp. projects 1999's worldwide unit sales will be 103.2 million units. Research by InfoBeads shows PC penetration jumped 5.5 points in 1998, the largest single-year increase since 1995. Plus, households earning less than $30,000 (almost 40% of all American households) accounted for more PC purchases than ever before. That's good news for the machines that have traditionally sold best to moneyed folk. Microsoft CEO Bill Gates predicts we'll blow past GartnerGroup's 65% penetration rate by the end of 2001.

These stories of growing PC use are the norm, of course, and accepting the status quo in computing is taboo. So plenty of innovators are looking for the Next Big Thing to replace the PC. IBM Chairman Louis Gerstner told investors this spring that "the PC's reign as the driver of customer buying decisions and the primary platform for application development is over." The general plan is to trade the PC for an array of portable devices that share information through wireless networks. Information appliances such as tablet-style computers, televisions with Internet connections, and palm-sized devices promise ease of use by sharing a PC's workload.

The promise of relief is tantalizing. A handheld device with narrowly focused capabilities should never require reinstalling the operating system or investigating DLL problems. Units such as Web-enabled cell phones and tablet computers will come on instantly, as will the Internet connection piped to your television through a cable line. The only general-purpose, PC-like device in this picture is an "information furnace" that runs the network. You'll sit in front of this unit only when you need to use a keyboard and full-size monitor for something such as typing a letter. Problems that develop in the furnace will get instant repairs diagnosed and sent through the Internet.

Even Gates, in a recent *Newsweek* column, explained that we'll someday use an array of computing devices, adding that "the PC model's common standards will be more important than ever." (Translation: Times are a changin', but let's keep our heads and make sure some form of Windows runs it all.)

Gates' subtle message demonstrates why we warn readers to be patient—and to be careful what they wish for. Ubiquitous computing isn't synonymous with utopian computing.

The new computing world will be slow-coming. Just think how long it might take to turn your current Internet connection into a wireless link that's reliable enough to be your primary conduit for information and computing tools. Then consider the premium price of all these gadgets. The masses are unlikely to ante up for a refrigerator that orders a new tub of Parkay as needed. Oh, you're uneasy at the thought of an Internet-connected fridge monitoring your diet. Privacy concerns are another inhibitor to connecting everything.

One major challenge is just getting all the connected computers talking. Microsoft insists its Windows CE is the platform to build around, but 3Com's Palm interface is outselling CE three to one in the United States. Sun Microsystems claims its Jini technology is the best way to easily connect everything from toasters to car stereos through networks. Consumers can plan on a confusing battle before a winner emerges.

The only certainty is that PC use will change and improve, but it's not in for perfection. The old PC format won't go away anytime soon. Considering the growing pains that lie ahead, maybe we shouldn't be so hasty to wish it would. ■

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